COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

October 18, 1972 Vol VI No 42

NEWSPAPER

NEWS IN BRIEF

U.S., IBM Will Have Their Day in Court

NEW YORK — After four years of training, IBM and the government have put on their antitrust boxing gloves. But the manufacturer would rather wait until after Nov. 7 for the heavyweight match.

A federal court judge here has refused IBM's request that the government wait until after the election to list its goals in the suit. Instead, Judge David N. Edelstein called for the parties to appear Monday, Oct. 16, so the Justice Department and IBM could make formal statements.

The manufacturer claimed the government was not well-prepared, and should at least wait until after Nov. 7 to avoid publicity or other pressures that could induce Attorney General Richard Kleindienst to produce an "ultimatum" rather than a plan for a possible out-of-court settlement or consent decree.

Edelstein signed the government's 1956 decree with IBM.

Component Failure Blamed In S.F. Train Derailment

Special to Computerworld

SAN FRANCISCO — The master computer system has been exonerated in the recent derailment of a Bay Area Rapid Transit (Bart) train. The train failed to stop at the end of the line and plowed through a sand abutment and onto an adjoining highway.

The accident was caused by failure of a component in the on-board circuitry, officials said. When the central computer signaled the train to slow down as it approached the last station on the line, the faulty component ignored the message. The train's human operator tried to stop the car, and managed to slow the train from 70 to 80 mph to about 25 mph when it hit the embankment.

The defective circuit has been returned to its manufacturer, Bulova Watch Co., for testing.

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Working Production System

A Liberal Mix of Software and Voila!

By Don Leavitt
Of the CW Staff

DECATUR, Ill. — While some software vendors are beginning to interface their products with other vendor products to give the user more power and flexibility than from using either product independently, a user here has taken a long step further.

Staley Manufacturing Co. has a Honeywell H3200 with 128K characters of memory, 11 tape drives and 175 M characters of disk storage. Once programmed it worked fine, but it was taking too long to develop programs, according to Standards and Program Maintenance manager James F. Simmering.

So he linked a file-management system written at Staley a Cobol precompiler from one vendor and a decision-table processor from another source, and turned the whole thing into a program production system that works. The productivity of each analyst/programmer jumped 25% the first year the company used the system, Simmering noted.

In addition to the master file ("catalog") programs created in-house, Staley uses a modified version of the Score precompiler from Atlantis Software and a decision-table processor developed by the U.S. Navy and acquired through the federally sponsored Cosmic clearinghouse at the University of Georgia.

Spotlight on User's Lib

The system works because it reduces development time, coding and keypunching errors, documentation and program maintenance effort. It works equally well for complex, application-oriented production runs and for one-time "management-science"-type reports, he said.

Each part of the system is important, but the company's ability to enforce its use is probably most significant, Simmering admitted.

The master file catalog, based on the Cobol library concepts, contains nearly all the information Staley pro-

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'Disfranchised' Voters Rescued By Tape Check

By a CW Staff Writer

NEW YORK — The value of computerized voter registration lists is being proven here as errors are corrected in tens of thousands of records.

A candidate for local election had changed that thousands of voters would become disfranchised, since they were notified they should go to improper polling places that would not have their names.

City officials now claim the disfranchisement will not happen, as voters are being informed of the previous errors.

The notification is being facilitated by the fact that index cards or paper lists are not involved in the validation; computer tapes are being corrected, so they reflect the proper assignment of voters to polling places within their precincts.

If all started when the legislature passed the reapportionment bill earlier this year, and redrawing the lines between voting districts became necessary. But the computer service firm hired to do the job for Manhattan made several errors in assigning voters to improper polling places, sources said.

When the errors were discovered, the city had to correct the tapes, which was done manually, rather than by comparing districts with census tracts, according to Alexander Bassett, Elections Board administrator.

Instead of running complete validation checks for such items as apartment number or party affiliation, Bassett continued, the addresses are manually being checked only against proper polling places.

Now, with a complete check of addresses against proper precinct, each voter will be reinformed of his proper polling place by rerunning the tapes and renotifying voters.

Misassigning the voters was a human problem, not relating to the original bill or to the errors of the computer service firm, he added.

CW Photos by Edward J. Bride

Kenneth T. Orr
in touch with technology

Maj. C.J. Beddome
fraught with politics

Thomas R. Gross
undue constraints

FBI Access Rule Called 'Power Play'

By Edward J. Bride
Of the CW Staff

NEW ORLEANS — The FBI regulation that law enforcement computers must be dedicated to this application is more a "power play" than a security consideration, computer experts and criminologists agreed here recently.

The FBI requires that access to its computerized criminal history (CCH) file be through computers operated and managed by criminal justice agencies, but this does not really ensure the security of data, according to panelists and audience members at an international crime symposium.

Instead, the goal of security and privacy is used to justify the acquisition of computers, and if the FBI argument is correct, then welfare agencies and others with sensitive personal information also should operate their own systems, panelists indicated.

Kenneth T. Orr, director of data processing services for the state of Kansas, said one basic question in this controversy is whether criminal justice information is more sensitive than welfare data.

In evaluating the possible acceptance of shared systems for criminal applications, Orr said several questions must be asked, including the following:

- Are the current FBI regulations economical, and in touch with technology?
- Does a dedicated system ensure security and privacy of data, or isn't management control sufficient?
- Is giving data to a third party — under permissable guidelines equivalent to "giving it away?" (at the end use of the data cannot be controlled?)
- Can a system be self-policing?

Orr also claimed the real issue in crime systems is not privacy, which has to do with the collection of data, but use of the data and how improper access can be

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Property Tax Basis Explained

System Software 'Measurable'

By a CW Staff Writer

SACRAMENTO, Calif. — The value of system software is measurable according to state officials explaining the new tax on "base operational programs."

The new tax is an emergency measure stipulating that all system software sold with a computer comes under property taxation regulations. Rule # 152 of the tax code is effective Oct. 19, officials to the State Board of Equalization reported.

The claim that the value of this software is measurable may draw opposition from users here and in other states, since the value of non-applications software has varied in past court action.

The state now says the entire price of a system, including the system software which is not normally priced separately but not including applications will be the basis for property taxation.

The state therefore avoids the necessity of actually measuring the value of systems software. As a result, users in states that exempt software from property taxes will get no assistance from the "clarification" of the new rule.

Likened to Law Books

Previous literature from the Board of Equalization said system software was comparable to "law books or other standard reference books," having value which is "measurable."

But other programs applications are more like "an attorney's brief, an engineer's calculations or business records," and trying to estimate their value "would be highly speculative," according to the board.

The board explained that the intent of the new legislation was to permit counties currently taxing system software to continue. Applications are exempt, at least for the next two fiscal years [CW, July 5].

"Taxation of these expressions of creativity would be detrimental to research and an expansion of business activity within the state," the Board said.

Few Surprises

There are few surprises in the state's definition of system software, or "basic operational programs," the language used in the law. One exception could be the inclusion of utility routines which are often sold separately by both the hardware manufacturers and independent software houses.

The three categories of taxed software, according to the state, are control programs, language translators and service programs. Included in the latter category are conversion programs, emulators, sort/merge programs and data-set utility programs.

Only those language translators used in "generalized" situations, such as those for Fortran, Cobol, PL/1, Algol and RPG, are included. Excluded are "programs which serve a similar purpose but which are developed to solve a specific application problem."

Navy to Centralize Pay

WASHINGTON, D.C. — The U.S. Navy is preparing a central computer programming system to be used by all activities that pay civilians.

The system, Cypay, will be a bank of payroll and accounting programs available to all Navy finance centers. This will eliminate the need for each center to write its own program whenever a change is required.

Calif. Unmasks Welfare Fraud

By Marvin Smalheiser
CW Correspondent

SACRAMENTO, Calif. — A computerized system to double-check state welfare recipient earnings has disclosed grant overpayments totaling $1.8 million in the Needy Children's Program, according to state welfare officials.

The system, which was recently challenged for allegedly violating welfare recipients' rights of privacy, disclosed grant overpayments averaging $490 per case in the initial three-month testing period.

David Todd, coordinator for the task force on welfare fraud, called the computerized system "very successful."

The test was made on 8,788 cases constituting the top 10% of all money earned by recipients of the Aid to Families with Dependent Children Program.

Of the total, 3,709 – or 41% – of the cases in the test were found to have received the grant overpayments of $1.8 million.

The overpayments were found by comparing the state Welfare Department's earnings tapes with the Department of Human Resources (HRD) tapes, which contain earnings reports filed by employers for unemployment compensation.

The Welfare Department information is extracted from tapes on an IBM 360/30 and then matched with information extracted from the HRD IBM 7080. The HRD is now converting to an IBM 370/165.

Comparison of the tapes had been held up for months because of protests by the Golden Gate Welfare Rights Organization of San Francisco which said the system violated a recipient's right to privacy.

The State Supreme Court approved the tape comparison, noting among other things it was only common sense for the state to compare its records.

Software Mix Proves Success

(Continued from Page 1)

grammers and analysts need to know about their files, including record layouts, intended purposes and how many programs are involved.

This latter attribute is particularly useful when a change in a file is contemplated, since the analyst can anticipate the full impact of the change rather than discover later that he had forgotten one or more programs that used the altered file.

Although this master file catalog provides Data Division File Descriptions (FD) that can be copied into Cobol programs as they are being built under the Score precompiler, it is *not* a data-base management system that creates a cushion between application programs and data files so program coding is independent of changes.

Every program must be recompiled to include the new FD, but at least with this system the user knows which programs must be done, Summering said.

The addition of a decision-table processor into the own-coding phase of Score has enabled Staley's DP staff to write some very complex programs, he noted. Decision-table logic is not easy to learn, but its potential is "unlimited" in Summering's estimation.

A 1,200-card Cobol program was generated by the Staley production system, he said, with an initial coding time, including preparation of input parameters, five decision tables and "considerable" own-coding, in eight hours. This program was originally expected to take eight man-weeks of effort to complete from start to finish. It was done in less than three, he said.

A good decision-table processor, such as Summering feels he has, actually serves two purposes. It creates very precise Cobol coding to reflect the conditions and actions, but, perhaps even more important, it bridges the communications gap between the user, the analyst and the programmer. It eliminates the vagueness of narrative descriptions that so often are interpreted differently by each reader.

Staley's system works well, Summering explained, because both the Score precompiler and the decision-table processor are "looping" packages; they tolerate, and pass along untouched code which they do not recognize as intended for their use.

Thus, the table entries, for example, go right through Score but are processed by the table handler. The Cobol code generated by Score, on the other hand, goes right through the decision-table program.

Score had to be modified somewhat to work with the other parts of the production system, and Summering gives full credit to Atlantic Software for providing the source code for Score so the changes could be made.

Summering said he wouldn't recommend a generated program for all applications, but as far as Staley is concerned, the production system has paid for itself in its first year of use.

All the Weather You Want

DENVER, Colo. — The U.S. Bureau of Reclamation will use a computer to simulate the weather conditions over the past two decades in parts of 10 western states, to determine the possible effects of weather modification on river drainages.

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Second-class postage paid at Boston, Mass. and additional mailing offices. Published weekly (except a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington Street, Newton, Mass. 02160. © 1972 by Computerworld, Inc.

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Criminologist Calls FBI Rule Power Play

(Continued from Page 1)

prevented.

He called the current regulations "oversimplified approaches to a complicated situation," and indicated some middle ground, such as "virtual dedicated," must be found.

Orr was a member of a "dedicated vs. shared systems" panel during the International Symposium on Criminal Justice Information and Statistics Systems, sponsored by Project Search and the Law Enforcement Assistance Administration (LEAA).

Project Search is now a study group specializing in the development of computer technology for the law enforcement community.

LEAA wanted to operate the criminal history file, but lost an internal Justice Department battle with the FBI, which now operates this file as an adjunct to the National Crime Information Center.

A companion panel to the ones on dedicated/shared systems covered the issue of security and privacy, and during each of the two sessions panelists showed overlapping concerns.

This may be partially due to the fact that only one hour was allotted for each session, although these were the two most controversial subjects discussed throughout the meeting.

Major C.J. Beddome, assistant chief for administration of the Arizona Department of Public Safety, acknowledged the issue of computer ownership is "fraught with political implications."

The person "with the keys to the computer has power," he said, hastening to add that, with the price of small systems today, computer usage is "in the ball park" of essentially all states.

Beddome said he was in favor of doing business applications in facilities completely separate from the criminal side.

On the other hand, Thomas R. Gross, project manager for the Los Angeles County Regional Justice Information System (RJIS), said users must consider a "degree of participation" before deciding on whether a shared or dedicated system is appropriate. He also claimed local police officials are often inhibited in their crime-fighting efforts by "undue constraints."

The general security/privacy issue is much larger than most people realize, stated David Martin, a special assistant to Elliot Richardson, secretary of the Department of Health, Education and Welfare.

Citizens in many countries are exhibiting a "malaise" about this technology because they don't understand it, he contended. Furthermore, management generally does not understand the workings of computers, leaving the "technologists" in charge.

David Martin
. . . computer malaise

"We're on a computer binge in this country and the rest of the free world," Martin said. He warned that people must wake up to possible adverse social implications, in order to prevent the adversity.

"Records have been with us for centuries," he said, adding there is an "undue concentration" being placed on this aspect of the trend toward creating data banks.

The combined effects of computers and communications technologies hold significant impact for other agencies, he continued, using the FBI's data banks as examples.

The director of NCIC calls the FBI a "holding company" for the states' data, insisting the system is state-controlled, Martin continued.

But the autonomy of the participants is going to be eroded if the current trend continues.

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Cutting Crime Should Be Goal

By a CW Staff Writer

NEW ORLEANS - Criminal statistics may be different from profit-and-loss statements, but it all boils down to the same thing when computer systems are being evaluated: are the goals being served.

"Don't lose sight of your primary goals" when evaluating computer systems was one principle stressed by Ralph M. Gutekunst Jr., during the international computer symposium here.

An original Project Search member, Gutekunst cautioned his audience not to develop systems as a goal, but to try to reduce crime, using computers only if they help achieve that goal.

The reduction of crime can be a measurable fact, if the proper environment for measurement is maintained, he continued, listing the following as factors:

- Accuracy.
- Completeness.
- Timeliness (data provided in time to help make a decision).
- Economy (not just cost, but cost-effectiveness).

Another symposium speaker claimed most evaluations are conducted "by the proponents of the change," and are therefore promotions for systems, rather than true evaluations.

Thomas McBride, assistant director of the Police Foundation, said a good model for evaluating police systems does not exist, and this fact is compounded by inadequacies in current crime-reporting systems.

Another problem facing would-be evaluators of systems is a lack of coordination among users of shared systems.

Robert B. Andersen, executive assistant to the criminal justice action program of the National Governor's conference, said system evaluation enters various stages of computer use, not just post-implementation.

Evaluation can also bring surprises, he indicated. If a system is designed for specific hardware, a user might find the hardware is obsolete before implementation, he said.

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States, County Barred From CCH File

By Edward J. Bride
Of the CW Staff

WASHINGTON, D.C. - Five states and at least one county data center have been denied entry into the FBI's computerized criminal history (CCH) file, until they can beef up security measures to meet FBI standards.

It was the second try for Hamilton (Ohio) County, which was evicted from the system because police officials do not have management or operational control over the regional center, FBI sources said.

On the other hand, two other states have given hire/fire authority of their data center personnel to criminal justice agencies, so they could participate in the CCH system.

In Cincinnati, the eviction of the Hamilton County Regional Computer Center (RCC) could mean a bigger problem, since voters must approve the renewal of a tax levy to fund the operation. Now the system also serves city governments and is operated by non-police agencies.

Since the center was originally designed to serve only police departments, some local sources expressed fear the voters might disapprove the .3 mill levy. Since there is no organized opposition to the tax, however, and since it is editorially supported by local news media, renewal of the levy is anticipated by Andrew O. Kinson, RCC superintendent.

The states of Iowa, Arkansas, Colorado, Indiana and North Dakota have also been rejected by the FBI because operating or planned data centers could not meet the FBI regulation that any direct access to the CCH file must be through a data center managed or operated by a criminal justice agency.

Management control translates to hire/fire authority, sources noted, and only two states have taken advantage of this part of the regulation.

Minnesota was the first state to sign an agreement between the management of the state data center and the state police, the agreement stipulates, generally, that if operators are found misusing data or violating procedures, the state police can have them fired or transferred to another application.

Ohio has formulated the same type of agreement between the state data center and the state highway patrol, although access to CCH is not operational yet, because the full configuration is not yet implemented.

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How Denver General Hospital took the emergency out of its replenishing procedures.

Denver General is a 350-bed hospital in Colorado's capital city.

Like most hospitals, it struggled with a 150-day inventory load that still couldn't eliminate expensive rush ordering.

Its accounting system could only account for about 75% of all items moving out of inventory. Which meant that somewhere along the line, 25% of proper patient charges weren't being made.

This year, Denver General installed SYSTEM TEN* computer by Singer.

Now, Denver General bills from its accounting process 100% of all inventory used.

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Once a week, purchase orders are generated from the system, with the ability to override orders in order to increase them, decrease them, or not order at all.

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The Computerized Campaign — Part II

Nationwide Efforts Include Millions of Names, Dollars

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. — While it is difficult to accurately figure the number of computer operations currently being used by candidates for electoral office, a look at some of the national operations and the application of the techniques in some large states gives an idea of their scope and extent.

On the presidential level, the Republicans are outdoing the Democrats, but that is basically because of the money available.

It is estimated that the Committee to Reelect the President, which is coordinating the Nixon computer campaign, plans to send as many as 35 million letters to voters between the time of the convention and the election. An additional 12 million were sent before the convention asking for funds.

On the Democratic side all the major candidates for the Presidential nomination used the techniques before the conventions.

But Democratic strategists have estimated the number of letters to be sent will fall somewhere between 10 million and 20 million, due mainly to less funds than are available to the Republicans.

The Republicans, for example, have targeted at least 13 states as potential big users of the computerized campaign techniques and the Committee to Reelect the President has even prepared a manual on how to establish and operate such a system.

The whole campaign "is basically devised by the national headquarters," according to Lin Nofzinger, a top campaigner for President Nixon in California.

In the computerized files for these 13 states the Republicans have almost every name, address, age, job, race, income and party affiliation as well as past voting record of every registered voter.

The names are not only compiled from voter registration lists, but are given to the campaign by friendly labor organizations, church groups, and are supplemented by lists purchased from commercial mailing list houses.

All the names are cross-checked by the computer to prohibit duplication and to insure accuracy.

The names for each state are sent to a computer center or several centers in the state for processing and the printing of the formal letters.

The Republicans also use the technique to make pinpoint mailings to target areas immediately following a statement by McGovern that might be contrary to the interests of that population segment.

The Democrats are also using the mailing technique widely, as in the following:

- In Ohio, the Democrats are budgeting more money than ever before for direct mail. To date, reports indicated the party here has spent well over $250,000 just for equipment and well over $100,000 for the initial processing.
- The Humphrey primary campaign in Florida cost at least $100,000 for computer mailings, according to most estimates.
- The Muskie primary effort in Florida, where his showing was dismal, involved over 500,000 letters prepared by computer for selected audiences.
- Sources close to the McGovern campaign have stated the campaign might well have died from lack of funds in the early days if it had not been for the great deal of money generated by a computer-based campaign for funds.
- In another case, it has been reported that the computerized mail campaign of Hubert Humphrey in the Florida primary alone sent out more than two tons of computer-generated letters, and the figure was definitely higher in Humphrey's unsuccessful bid in the California primary.

How the techniques are used and their importance can be seen in the Nixon California campaign, an important campaign since California controls the largest number of electoral votes.

For example, Robert E. Walker, an aide to Gov. Ronald Reagan and chairman of the Nixon campaign here, recently said that "past campaigns have relied disproportionately on television. This one will rely more on personal contact through the mail and telephones."

One way the Nixon campaigners are using the system is to identify youthful voters or those voting for the first time. Out of the 4.7 million voters between the ages of 18 and 30, Republicans determined the President's campaign would have the best success with those who did not attend college . . . a computer run determined that only 1.2 million were in school.

Dr. Jim Gibson, a consultant to the California campaign, determined that most of these potential voters for Mr. Nixon lived in either apartment houses or relatively low-cost housing tracts.

From that point it was easy to run Census Bureau figures through a computer in order to determine the average number of 18 to 24-year-olds in a particular census tract.

For example, if the average was 50, "we then ask the computer to pick out every census track with 55 or more. You can do it with senior citizens or any other category in the census," Gibson said.

It is those areas that the campaign's volunteer workers are assigned, since the prospects for success are greatest.

It All Costs Money

It is hard to estimate the costs of large mail campaigns, but some sources place the average at around 15 cents to 20 cents a letter, even though it can be lower for some large campaigns.

So with at least 40 million letters planned for this fall (somewhere over 10 million for the Democrats and 25 to 35 million for the Republicans), the cost of the computer-based mail campaign, just for the presidential race, could be as high as $8 million.

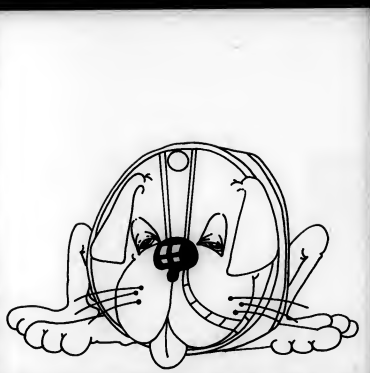
In more local races, one large firm providing computerized mailing services quotes a price of $13,500 for a mailing to one congressional district. If a candidate wants a mailing to an entire state, the price drops to $10,000 per congressional district.

Beta Urges Privacy Action

LONDON — The Business Equipment Trade Association (Beta) has urged immediate action on the Younger Committee's proposal for a standing commission to safeguard privacy in computer use. Beta has offered the services of its members to serve on the commission.

Introducing TMS.

The computer tape watchdog.



County Billing Stings Users

By Marvin Smalheiser
CW Correspondent

LOS ANGELES – The county data processing department has established a new billing system that is taking the pinch out of the county's costs but is making some users cry "ouch!"

The system uses a program, county officials said, which provides a more fair distribution of costs as opposed to a hand-logged system based on a flat-rate.

The new billing system has been instituted at three county facilities and the sting of the system was felt last spring by several cities with increases of up to 600% for DP charges related to the preparation of materials and supplies for elections.

The new system identifies particular jobs performed on the computer system and tracks start and stop times. Program segments performed, the number of reads and writes and a large quantity of other data is produced to create the new billing.

DP Education Needs 'New Approach'

By Edward J. Bride
Of the CW Staff

BETHESDA, Md. – There is a real crisis in the public schools' attempt to use computers in teaching: teacher motivation.

But even when this is solved, the problem of people's computer illiteracy will persist in the majority of these schools, experts have told the government.

While much emphasis is being placed on educating people about the "social implications of computers," the problem of the role of computers in everyday life is more difficult.

Teacher motivation may be a beginning target area, but a whole new approach to using computers is needed, and few people in the U.S. have the proper concepts and can relate them to children, a government panel has been told.

The panel, studying "automated personal data systems," heard several witnesses talk about the crisis, which Prof. Joseph Weizenbaum of MIT called a "real tragedy."

Teacher motivation is not enough to solve the problem, Weizenbaum continued, since most teachers don't have the understanding that people like Seymour A. Papert, a panel witness and Marvin Minsky have.

These two are among the few knowledgeable people who can educate teachers properly, he noted.

New Approach Needed

Papert appeared before the committee and advocated a totally different approach than the traditional poetry-writing exercises or question-answer math problems.

As an example, he used his famous remote-controlled "turtle," which is a generalization for any device following commands, either through physical movement on a floor or apparent movement as on a video display.

The whole concepts of movement and balance can be taught by building models of people or devices like his turtle, Papert indicated. The ideas of angles, direction and measurement can be taught by instructing the "turtle" to create a triangle.

Since a youngster would be required to instruct the turtle, and could see what happens when instructions are incomplete, this is far more valuable than telling a person to draw an equilateral triangle. Papert suggested.

Weizenbaum said poetry-writing examples are "terrible" because they can disturb children's future ability to read – or maybe even to write – properly.

Dr. William F. Atchison, director of the computer science center of the University of Maryland, said he went into mathematics because he had a good math teacher, and the same idea pervades any discipline.

Secondary school efforts in computer-use have failed because there are still no funds available, he added.

John N. Williamson of the Rand Corporation said there is a "real crisis, at least in the public sector," and that many schools claiming comprehensive applications really have "trivial uses."

The high wave of interest is past, he claimed, adding it is "difficult to find curricula of substantial value."

"We should have been at this point 10 years ago," he said.

Weizenbaum agreed with this observation, too, acknowledging the "poverty of good educational material."

Manufacturers Urged To Include Monitors As Basic System Tools

SAN FRANCISCO – All computer manufacturers should be encouraged to include built-in performance monitors on future computer systems for the self-measurement of those systems, attendees at a recent panel on computer performance evaluation agreed.

These tools not only are helpful in determining how efficiently a system is being used after it is installed, but also can aid users trying to determine their computer configurations, the panel agreed.

In a paper on this subject, P.M. Russo of RCA Laboratories indicated "system resource utilization is very highly dependent on the program load" of the system.

For example, he indicated, his analysis of the Series 70 computers (formerly the Spectra 70 line) showed the system overhead on typical scientific operations could run as high as 20%, while the overhead taken up on typical business applications could be as low as 3.2%.

He cautioned, however, these figures would not be true for all job mixes in either area, but said they did indicate the range of differences between computers with those workloads.

The experiments with the Series 70 machines showed, he said, that the computer's "resources are generally used intermittently. They are heavily loaded for short periods of time and remain relatively unused for long periods of time.

"This is especially true of I/O devices," he added.

In the performance-monitoring experiments, he said, the counter contents were dumped to tape every minute, giving a clearer picture of the system operation than was possible with the widely used averaging process.

With this analysis, it was found that long assemblies and compilations are "about as efficient as object executions" and that "short compilations and assemblies, due to fixed overhead, tend to make inefficient use of system resources."

In addition, it was found that "multiprogramming does not significantly increase CPU utilization, but it greatly increases resource utilization (more resources run in parallel) and throughput."

Meet the new Tape Management Software (TMS) from University Computing Company (UCC).

It leads you right to the facts about every tape you own, trapping the kind of information you need to protect your data and manage tapes wisely.

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Reforms Decrease Addicts on Welfare

NEW YORK – Welfare reforms, including a computerized central index of narcotics addicts, have resulted in a decline in the growth of the number of addicts on welfare, and could represent a potential annual savings of $2 million to the city.

In the six months since the computer file was established, the city has prevented over 500 duplicate applications from being processed, according to Ken Harris of the Human Resources Administration.

Under the new reforms, addicts applying for welfare must present several proofs of identification, including birth certificates, drivers' licenses and draft registrations.

Many addicts try to use the same birth certificate twice with only the name changed to get additional payments, Harris said. The computer file contains all known addicts' ID numbers and daily printouts allow the agency to match ID numbers to determine whether an applicant is already on the welfare rolls.

"So far we have caught 576 duplicates," Harris claimed.

The file also contains information on each addict's treatment program, and case workers can determine whether the addict is attending his program regularly, another new requirement for remaining on welfare.

The present system, which

News Wrapup

utilizes two IBM 370/155s, is only the first stage.

County Record Keeping Gets Streamlined Plan

SPRINGFIELD, Ill. – The state treasurer's office will provide computerized record-keeping and reporting systems to Illinois counties to keep track of invested public funds.

The system used by the state could save counties which choose to participate more than $75,000 a year in record-keeping expenses. Under a new law, treasurers in counties with populations over 150,000 must invest at interest and make monthly disclosures of all public funds needed for expenditure within 30 days.

The computer program includes such information as maturity dates, interest rates and types of accounts.

Rise in GNP Predicted

PHILADELPHIA – Two separate computer models of the U.S. economy have predicted a sharp increase in the Gross National Product and an 18% increase in pretax corporate profits for 1973.

One model, at the Wharton School of Business at the University of Pennsylvania, predicted a gain of $114 billion in the GNP, while a similar model at the University of Michigan pprojected a $119 billion rise.

Self-Portraits Easy

NEW YORK – Ever had the notion to paint your own portrait, but were short on artistic ability?

The Craft Master Division of General Mills Inc. has a paint-by-number kit made from a computer-based process that generates color-coded line drawings from photographs and slides sent in by consumers.

The original picture is rephotographed to conform with color tones stored in the computer; then the new photo is scanned to determine the colors at each point and a line drawing is created on special paper.

The process, developed by Itek Corp., Lexington, Mass., handles only head and shoulder portraits at present; more elaborate programming is required for landscapes.

For $19.95 a customer receives an enlarged 16-in. by 20-in. drawing, a practice picture, brushes and paints.

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IBM announces System/370 Model 125 with virtual storage.

Virtual storage, which can greatly broaden the range of applications feasible for an IBM System/370 computer, is incorporated in the new Model 125, the lowest-priced computer in the System/370 line.

By freeing programmers from much time-consuming and routine work, virtual storage can increase their productivity. It gives the Model 125 an apparent main storage capacity many times greater than its real main storage.

Other advanced functions offered by the Model 125 include on-line data entry and teleprocessing.

Many companies can now keep all of their data files on line all of the time using the 3330-series, which provides the lowest cost per unit of storage of any IBM disk drive. Directly attached to the Model 125, the 3330-series makes available from 200 to 400 million bytes of information for massive on-line data base applications. This can open up a whole new mode of operation for many users.

And through the 125's teleprocessing capability, access to such a data base can be extended to widely-separated remote locations—company departments, branch offices, manufacturing facilities.

A TV-like screen simplifies the operator's job by replacing most of the lights and switches traditionally associated with computer consoles. The screen displays data and instructions being entered at the console keyboard, as well as desired data in the system.

The new System/370 Model 125. It meets the needs for advanced computer functions.

IBM

Editorial

Packaging Accuracy

Software systems – and their documentation – have to be accurate to be of any real use to the DP community. A program should do what it purports to do, and do it effectively within the stated time and equipment constraints.

This was certainly implied by Larry Welke when he urged the recent Honeywell User's Group meeting to go the packaged software route, rather than stick to the "not invented here" syndrome.

Users should try to keep statistical summaries of errors and error patterns in the software they use – no matter what source.

These summaries certainly ought to be reviewed with the vendor, but after that, perhaps they should be turned over to some other body, perhaps the National Bureau of Standards, for unbiased analysis.

Users thus will help not only the producer of the particular package but the entire computer industry by identifying those areas that need careful checkout and testing before being placed into operation.

'So You've Sold Yours for 10 Years? Then We Know Ours Will Work!'

Letters to the Editor

Societies Can't Survive Without Consolidation

Stanley Rogers' comments [CW, Aug. 23] in response to my letter [CW, July 5] advocating the consolidation of computer societies are of great interest, and certainly present a perceptive view of the practicalities of the problem.

I would hope that Rogers might be persuaded to apply his experiences in this area to finding a workable way to accomplish consolidation, for I am convinced that the present structure of the societies simply cannot survive.

I would like to proffer a few additional observations on the problem. First, although the real power in a professional society rests with the enfranchised members, power is really wielded by a relatively small percentage who are the most active members.

As Rogers points out, it is difficult to get any large percentage of the members to vote on anything. However, 100% of the members do take time to pay their dues once a year, and therefore it must be possible to get them to respond to something sufficiently important.

One would hope the small group of officials in power would recognize the need for merger. Unfortunately, this group is human and may well be jealous of its prerogatives, titles, privileges, power, etc. No consolidation can occur until and unless societies are headed by a reasonable number of reasonable men.

I must disagree with Rogers that the opportunities for active individual participation decrease as a society becomes larger. Having held many positions in both the IEEE and ACM, it has been my universal experience that the problem is finding members willing to devote the time and energy to serve.

I do not pretend to know the ideal path to, or the ideal configuration of, a consolidated computer organization. However, I think we must conclude we have too many societies, too many conventions, too many publications, too many dues. Starting from that base, we can at least begin a minimization program.

Since the local chapters are the most valuable parts of the societies, let us start at that level, with joint monthly meetings (which are often done regularly, with huge success, by the New York City Chapters of ACM and of IEEE Computer Society). If we can create a pattern of successful local cooperation, perhaps upward pressure can achieve the same result at the national level.

Dan M. Bowers
Consulting Engineer
Orchard Park, N.Y.

Cobol Needs Evolution, Not Revolution

I read with some surprise the Professional's Viewpoint in the Sept. 20 issue. It seems to imply some things which may not have been intended and therefore I present some of my personal reactions to the article.

Does R. Risley propose that Ansi should be both the developmental group and the authority on standards? That would make them judge, jury and executioner! Let us preserve Cobol from such a fate.

And then Charles Ficklin justifies retaining the Report Writer facility because its deletion would "degrade the industry for idiots." I feel sure that many Cobol programmers who have never used the Report Writer rank considerably higher than "idiots."

Would Ficklin tell us the usefulness and effectiveness of a computer language are measured by its unreasonable complexities?

Am I to believe that given a choice between completing 15 to 20 specification cards for a report generator or 100 or more cards to do the same job with the Report Writer facility, only the "idiot" would use the report generator?

Next we come to the subject of making proposals being considered by the Programming Languages Committee public before they are considered. Such an idea has some merit. But should the PLC go to the time and expense of making the Cobol community aware of what is being done?

They might be persuaded to delay consideration of a proposal for 60 to 90 days since very few proposals come up for consideration within even six months of their initial distribution. Such a resolution as is proposed would be counterproductive and would perhaps leave the problem of deciding when a proposal has had sufficient publicity.

Much of the article tends to propose slowing down the PLC. But then later: "The Codasyl member also believes that faster consideration should be given to proposals." If this means the length of time between distribution of a proposal and its consideration is too long, then I'm afraid I've missed the point.

If on the other hand it means the PLC spends too much time in consideration of a proposal, then there exists a serious misunderstanding of the function and workings of a developmental body such as the PLC.

Indiscriminate passage of proposals without sufficient investigation of all the ramifications would surely destroy the language.

I certainly agree that an informed Cobol community would be an immense asset to the PLC, but I would prefer evolution to revolution.

Chris Coddington
Walnut, Calif.

Virtual Memory Cuts Wait Time Overhead

John Hunter and Dan Tanner claim in the September 20 issue of *Computerworld* that the overhead of virtual memory is "high at best and horrendous at worst." Hunter and Tanner assume the user will run jobs with excessive real memory requirements. This indeed leads to excess paging overhead.

It should be remembered that there are two forms of operating system overhead. The first is the overhead of the operating system carrying out its own functions such as paging. This overhead is increased by virtual memory.

The second form of overhead is the wait time when the operating system can find no task to dispatch. Paging provides the relocation facility new to most IBM computers so the operating system will be able to multiprogram more tasks. With more dispatchable tasks, wait time overhead will be reduced considerably.

A virtual memory system properly designed and used will have greater throughput than the equivalent real memory system without the relocation facility.

Robert L. Rosenfeld
Consumers Power Co.
Jackson, Mich.

One Data Bank Best

All *Computerworld* readers use and understand data banks. Most individuals have some sort of a record in a few of the following normal data banks: employer; IRS and FICA; hospital and medical; local bank, building and loan, small loan company; city, county and state tax bureau; credit cards; credit bureau; insurance; armed services; and police (local, state or federal).

I am tired of all the "doctrine of permissiveness" publicity given to this "right to privacy" bunk. The only value to all the time, words and paper wasted on this subject is there are too many numbers and separate data banks instead of one good one.

A complete data bank should be established and maintained by Social Security number for all citizens, and by a special security number for all noncitizens, "from the cradle to the grave."

The computer will never tell and access is easily controlled.

T. Eickmeyer
Dayton, Ohio

...Another TP Program

Re: a recent letter from David Sibler of London [CW, Sept. 27] – there is another "formalized" academic program in telecommunications at West Coast University in Los Angeles.

It is an option (major) in the graduate curriculum leading to the Master of Science in computer science.

H. Cole
Director, Computer Laboratories
West Coast University
Los Angeles, Calif.

Bible Tells Us So

Individuals concerned about the proposed use of Social Security account numbers as Universal Identification numbers [CW, Aug. 30] will find Revelations, Chapter XIII, verses 16 and 17, their New Testaments Bible very interesting:

"Also, it caused all, both small and great, both free and slave, to be marked on the right hand or the forehead, so that no one can buy or sell unless he has the mark, that is the name of the beast, or the number of its name."

Dennis L. Smith
Ft. Meade, Md.

Power Is Conventional

In Part III of the IBM Advanced Function series [CW, Oct. 4] authored by Dan Tanner and myself, the statement that IBM's Power permits asynchronous execution of problem program and output is incorrect. Power uses the same spooling principle as most conventional spooling routines.

In the same article, Universal System's spooler is called DOS Asap; it appeared in print as DOS, Asap. In most cases this would be a minor error not worthy of mentioning, except a software package called Asap does exist. The latter is marketed by Information Sciences and performs data management and IS&R functions.

John J. Hunter
Associate Editor
Auerbach Information Inc.
Philadelphia, Pa.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Better System Plans Can Prevent Computer Victims

The Taylor Report
By Alan Taylor, CDP

At 4 a.m. one September morning, as the schools were reopening for the 1972-73 year a mother and her three small children became, they thought, victims of the computer age.

The Avis car that was to take them from Logan Airport in Boston to their new home, 30 miles away, did not materialize as promised. Mrs. Claire Baker was tired after closing up her house in Texas, and then flying overnight to Boston with the children. She wanted to have the children rest a little before going off to start the new school year.

Claire Baker blamed computers for the problem, and so brought nearer the day when arbitrary government action may be taken to protect the Claire Bakers of this world.

The Boston Avis explanation was quite simple. Claire Baker did not have a credit card, and so Avis could not let her have a car, even though one had been promised by the Avis representatives in Texas. (The Bakers always use cash.)

The plight of the Bakers, and the responsibility of Avis for this plight did not stop this firm refusal.

Later other Avis personnel were to have other explanations. One pointed out that Avis was only a franchise in Boston, and so was unable to promise anything for the franchisee! A system designer tried to exonerate the computer system, the much advertised Wizard of Avis, by explaining that the equipment which was so opeoly on view in Boston was only a shell – and that it would not be operational for another month or so.

Human Error?

The favorite Avis explanation was that a "human error" had occurred when the booking was accepted without telling Claire Baker a credit card would be required for hiring a car during non-business hours.

None of this affected the fact that Claire Baker was hurt by a system which she believed in because of its "computer" facilities, and that she now is down on computers.

The Avis explanation of a human error – the accepting clerk did not warn of the need for a credit card, or the need for prior Cash Qualification (which can only be performed in normal business hours) – does not hold water. Avis knows of this type of occurrence. The firm could easily put notices on their counters so that customers could see them.

A system error in failing to qualify the services is certainly involved here. But so also is a major information system point which currently bedevils many computer systems – and hurts the computer image accordingly.

Wrong Information Derivation

The data available to the Boston clerk included but was not limited to the fact that Claire Baker did not use a credit card. It also included the statement that a car had been promised to her.

From this data the clerk derived a conclusion that the promise should be dishonored.

Such a conclusion, from an information theory point of view, can only be derived if all people who can rent cars must have credit cards – which not even Avis claims to be true.

> *"Avis may be at fault – but really the fault lies with the whole profession. Stopping these occurrences is a professional concern, and the lack of concern over the years has amounted to an effective license for bad practice being given to everyone."*

The basic system mistake – beyond advertising the services of the Wizard of Avis when they were not available – was in assuming that information is like data, and can be "binarily" reversed.

The system assumed that the statement "she could be trusted if she had a credit card" can be reversed validly into the statement "she cannot be trusted unless she has a credit card." For only a positive knowledge of untrustworthiness can excuse giving and then breaking promises.

Lack of system is hardly an acceptable authority, particularly when the problem has been known to exist for years.

Avis had no such knowledge of untrustworthiness – but simply assumed it – and thereby victimized the Baker family.

A Professional Matter

Avis may be at fault – but really the fault lies with the whole profession. The lack of concern over the years has amounted to an effective license for poor practice everywhere.

Yet it is possible to avoid such poor practice, and prevent individuals from being victims of the computer. At the input terminal, for instance, the program could supply a statement about the need for a credit card. That would systematically safeguard matters.

At the Boston end also, the Avis clerk could have assisted. Cash qualification is possible even during the small hours. There are businesses which have 24-hour guards. There are executives who can be contacted even in the night under this type of circumstance.

Really trying for verification can be built into the system, by prompting the counter clerk – or by providing information to the disappointed customer. (Some of this prompting will be in the Wizard system when it becomes operational.)

And it would stop the cry of "human error" being used to cover up a system loophole.

In the data base itself there are additional ways of helping the potentially victimized outsider.

The Avis system uses a "hot" list of wanted cards, and other names it has a specific reason to believe are not trustworthy. Naturally, the firm likes this list to be as comprehensive as it can make it – for the cars are valued at $3,500.

This "hot" list could have been searched and the presence or absence of the Baker name on it could have been noted. An assurance that it was not listed, in conjunction with the available information and hard cash from Claire Baker, could have helped the clerk overcome the "human error!"

Again, such a search would not involve any active collection of new data – only the more complete use of available data. Of course, a positive approach would permit the Bakers to input details of their financial and identification stability to prevent this type of mix up.

Positive action in the face of known problems in the consumer area is becoming generally obligatory nowadays – and there is no reason why the computer field should be exempted.

But it was not done in this case. Avis apparently feels its computers are blameless because it did not positively instruct the personnel concerned to first of all promise, and then not deliver on the promise. But the fact remains, the computers in conjunction with responsible management could have protected Claire Baker from enduring this problem.

Technically, this is quite true – so now we have to face the fact that Claire Baker was a computer victim – even though only a ghost of a future computer system was there to watch it happen.

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Possible Actions to Stop Victimization by Computer

- **At initial contact** – a full display of assumptions, or a written statement for the client.
- **At point of action** – a prompting method of possible actions, or a written statement of possibilities for the client.
- **As the message moves** – a check on whether adequate credit information is in the message booking.
- **When trouble occurs** – use of the data base to assist solution positively.
- **When the trouble has not yet occurred** – provision of data base space to avoid future trouble.

These actions are all technically possible, and have little expense involved. The failure to provide them will facilitate non-technical action to stop computer-related systems.

Security Manual

FREE SEMINARS

FOR USERS AND PROSPECTIVE USERS OF DATA BASE MANAGEMENT SYSTEMS (IMS, TOTAL & RDMS) AND THEIR AUDIT STAFFS

The Cullinane Corporation will conduct two seminars on its OUTPUT PROCESSORS at the American Management Association Building, West Higgins Road, Chicago, Illinois on Wednesday, October 25, 1972. Specifically discussed at the morning session will be the IMS/CULPRIT, TOTAL/CULPRIT and RDMS/CULPRIT Systems. Presented et the efternoon session will be the EDP-AUDITOR System. The CULPRIT OUTPUT PROCESSORS are generalized retrieval systems designed to access all types of files and to be used as the output processor of production systems as well as for one-time reports.

CULPRIT FOR IMS, TOTAL, AND RDMS

This 9 AM-12 Noon session will be conducted by Mr. John Cullinane, President, and Mr. Thomas Meurer, Vice President, of the Cullinane Corporation. As a member of the Cullinane Corporation staff, Mr. Meurer has had technical responsibility for the development and installation of the CULPRIT OUTPUT PROCESSORS for use with Data Base Management Systems. Mr. Meurer was formerly Data Base Administrator at Generel Tire & Rubber Co. where he was one of the earliest TOTAL users. He has also lectured on Data Base Management Systems on numerous occasions. The session will be of value to the experienced users of these Data Base Management Systems as well as prospective users.

EDP-AUDITOR

At this 2 PM-5 PM session, the Cullinane Corporation will make a presentation on its highly successful EDP-AUDITOR System including those versions for use with Data Base Management Systems (IMS, TOTAL, and RDMS). Also discussed will be the LIBRARY OF ROUTINES for statistical sampling provided with the EDP-AUDITOR System as well as background on the EDP-AUDITOR Users Group including the agenda for the EDP-AUDITOR User meeting and members of the group. The EDP-AUDITOR System has met with great success during the past year. Those interested in edp audit will find this session of value.

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The Professional's Viewpoint

Ansi, and Not Codaysl, Is the Real Cobol Problem

By A. Placer
Special to Computerworld

In the past, several complaints have been made about the slow operation of the Programming Language Committee of the Conference on Data Systems Languages. However, an illustration from a recent item perhaps explains why the PLC should not take all the blame, but also the Ansi X3J4 Committee meeting.

For instance, take proposal Ansi-72012. The fact that Ansi has proposed this

This Professional Viewpoint Page was prepared by the Society of Certified Data Processors in conjunction with the editors of *Computerworld.*

number is public knowledge; the content of it, however, is not. It is reported in the minutes of August 1972, but these minutes are kept secret. It also appears as a proposal in the public minutes of the Ansi PLC, but the proposal itself remains secret.

Without breaking the secrecy, it is hard to explain the problems. But the proposal contains 15 items, lettered "a" thru "o" respectively. A committee source gives the following breakdown:

- (a) adds the word "STATEMENT" to the existing wording "The Disable" statement will . . . . . .
- (b) inserts a comma where apparently none is needed.
- (c) changes the verb "FORM" to the verb usage forms. This is grammatically required, but does not involve any technical requirement. Apparently the Ansi X3J4 committee relies so much upon getting its dots crossed by the PLC that it cannot make grammatical changes itself.
- (d) deletes an extraneous comma.
- (e) is a genuine correction. This is the first genuine correction – something was overlooked by the PLC.
- (f) makes no change at all.
- (g) is grammatically needed, but again has no effect on the technical content – it is inserting more commas. This is exactly like the situation with (c).
- (h) inserts commas exactly the same way, without any change in technical content.
- (i) and (j) change a general rule to a Syntax Rule.
- (k) is an interesting case. It is deleting an explanation that is not explicitly stated anywhere else. Why this should be necessary at this stage of the operation is not at all clear.
- (l) is a good item. It does make more explicit the technical intent.
- (m) corrects an omission, again a good item.
- (n) is another nitpicking change, not quite as bad as some of them, but rather inconsistent. The actual change is to make "Fixed Insertion Editing" into "Simple Insertion Editing." Unfortunately, while the change is made in one place, it is left alone in others. This therefore now creates a series of inconsistencies in treatment.
- (o) changes "the Operating System" to "Mass Storage Control System," neither of which are under the control of either Codasyl, or X3J4.

To summarize, what the PLC has to put up with from the American National Standards Institute X3J4, and which clogs the PLC operation, is typified by this 15-point proposal.

It will take the PLC one-and-a-half-hours to consider this proposal. This will delay a lot of worthwhile proposals.

Of the 15 points, nine are for cosmetic effect, two (b and h) will probably create errors, one (o) has nothing to do with Cobol. Only three out of 15 have any technical consequence.

Does this help Ansi get out the new standard? It certainly does not help the PLC carry out its function.

A. Placer is a pseudonym for a Codasyl member who is in a position to see the effects of Ansi X3J4 actions on Codasyl operations.

Students Find Options Improve

BOONE, N.C. – Students in a computer science class at Appalachian State University played a role in the development of a computerized registration system being used by the university.

Aware of difficulties encountered at other universities, students provided input as to what they wanted from such a system, which was used by the computer center personnel to prepare a program giving "the student every possible option," according to Arthur S. Gloster, director of the computer center.

Students can revise their requests almost up to the beginning of the new term, and indicate pertinent information such as a desire to avoid a certain professor in history and 8 a.m. classes.

The computer, a Univac 9400, will also be used to keep track of students' degree plans, starting with freshmen this year. Each student will know what credits have been applied toward his degree and what he still needs, as copies will go to students as well as the registrar.

In addition, the center also handles student accounting, report cards, permanent records, student loans, textbook rental system and payroll, library purchasing and housing assignments.

The center performs scheduling for secondary schools in three counties, and also runs payrolls for the Blowing Rock and Watauga County hospitals.

Early School Start for DP Urged

RIO DE JANEIRO, Brazil – Computer education should start as early as the secondary school stage, and not be limited to mathematical instruction, participants at a recent conference on computer education in developing contries agreed.

Young persons "learn computer technology and logic very quickly and should have no problem absorbing it at this early level," according to a preliminary conference report.

To overcome the shortage of teachers, programs should be organized to train all teachers in computer science, the report recommended.

Proper curricula at the university level are also of prime importance, but the meeting stressed that each nation should adapt courses to meet its particular needs, rather than blindly follow the ACM Curriculum 68.

Participants generally agreed on the need for countries to promote expertise in hardware and software, if only to "achieve a somewhat relative spiritual independence from more developed countries," rather than relying solely on foreign expertise.

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Random Notes

PL/I, Assembly References Shown in 'Strobe' Reports

CAMBRIDGE, Mass. – CPU usage within PL/I or Assembly language programs is identified by symbolic source tags and statement numbers as well as by storage address, with enhanced versions of the Strobe measurement package. Initially, Strobe provided source references only for Cobol programs [CW, April 26].

There have been no changes in the data-gathering or reporting modules of the system, but new extraction routines, used at assembly/compilation time, now permit the development of source cross-references in the user's choice of language, according to a spokesman for the Strobe distributor, Programart Corp., 133 Mt. Auburn St., 02138.

Allen-Babcock Net Installs TSO For 'Interactive-Batch' Work

LOS ANGELES – Users who have been considering the capabilities of IBM's Time-Sharing Option (TSO) under OS/360, but who couldn't justify implementing it in-house, can access the facilities through a TSO implementation recently installed on the Allen-Babcock time-sharing network.

TSO is designed to bridge the gap between conversational programming and batch processing. Programs can be written in any IBM-supported language, including Basic. Allen-Babcock's implementation will include specially developed terminal-oriented versions of the languages. Allen-Babcock Computing Inc. is at 1800 Ave. of the Stars, 90067.

Radio, TV Ads Logged, Billed

WHITE PLAINS, N.Y. – Broadcasting stations with access to a 24K IBM 3/10 can gain better control of their spot announcement advertisements with the newly announced System for Television and Radio software package from IBM.

The daily broadcast log generated by the system allows users to pinpoint unsold air time, resolve scheduling conflicts and avoid broadcasting competing ads too closely together, IBM said.

Payrolls Handled in 18 Hours

N. HOLLYWOOD, Calif. – The Pay-Fone Systems Inc. payroll service uses a specially designed terminal and falls halfway between remote batch-processing and a classic "service bureau"-type operation.

Working with a Touch-Tone pad-based unit, users send pertinent data to Pay-Fone's data center at their convenience.

The center batches work from various clients and completes processing in time to hand-deliver the payroll checks and other paperwork to the clients within 18 hours of when the data was transmitted.

Pay-Fone is at 5940 Laurel Canyon Blvd.

Views of an '1130 Bigot'

S/3 Fortran Gets User's 'OK, But...'

By Don Leavitt
Of the CW Staff

PALM BEACH, Fla. – A major problem faced by Fortran programmers caught in the transition from an 1130 to a System/3 is their own bias. Many 1130 users have been spoiled by the simplicity of their machines, which were built for scientific work, and these people ("including me") are pure and simple "1130 bigots," Ed Lamb of Perry Oceanographic Institute said in a recent interview.

Perry was one of IBM's test sites for S/3 Fortran earlier this year. Detailing differences between the two computer systems, Lamb called the switchover a "really interesting" challenge. Much as he fought the S/3 compiler at first, he now sees it as a good system, but one that requires a good deal of "getting-used-to."

Fortran for the S/3 works well, he said, with an I/0 efficiency that is "more than acceptable." But there are some 20 areas, in his view, in which the converting 1130 user has to be careful. In some cases, the S/3 approach is better than the 1130; in some cases it is worse. In any case, users should be aware of the differences, he said.

First on Lamb's list is the fact that the 1130 normally works with "integer x 2" data, handling two bytes or 16 bits at a time. The S/3 Fortran, on the other hand, can work with either "integer x 2" or "integer x 4" data. These can be intermixed and must be defined.

A routine can be shifted "as is" from the 1130, but if it encounters "integer x 4" data when it should get "integer x 2," it will execute producing garbage results without any error flag.

This is the same kind of problem a user would get if he tried to use an 1130 routine on a 360, but that doesn't make it any easier for him to accept on the S/3, the user said.

Unique Names for I/O

Aside from that, the new S/3 user will be frustrated at first by the requirement that all I/O device numbers must be unique; on the 1130, references could be made to card reader 1 and to tape unit 1. This again is a reflection of the S/3 designer's attempt to be comparable to the 360, and is a legitimate approach, but frustrating to the "1130 bigot," Lamb added.

The compiler itself deserved some hard knocks in his view. Though compilation speed is good, there is a 27-second delay between the call for the compiler and the time it starts to work, he said. Beyond that, it is an interpretive processor rather than a true compiler and that means it requires much more core, at the same time it is costing the user processing speed.

That may be more of a problem for the scientifically oriented user who has

(Continued on Page 14)

'Capri' Eases CRT Programming For 'Any' CPU, Terminal Mixture

MINNEAPOLIS – The CRT Applications Program Interface (Capri) package has been described by the vendor, Universal Systems Associates, as a "mini CICS," but that isn't necessarily accurate since it suggests that Capri is IBM-oriented.

Capri, like IBM's Customer Information Control System (CICS), reduces the technically important but application-irrelevant coding needed to use CRTs. But Capri is hardware-independent and has been installed on Burroughs B6700 and Univac 9400 as well as IBM 360 CPUs.

It can be adapted to function with a range of CRT terminals as well as CPUs, a spokesman said. Bunker-Ramo and Univac Uniscope 100 and 300 devices are currently supported in addition to several IBM models, he added.

Capri has been designed to include the basic needs of almost any CRT-based application, including generation of display screens, traffic control, data validation and storage and retrieval of intermediate results, the firm said.

The display screen generation facility means, for example, that the programmer does not have to "hard-code" what Universal calls the elaborate bit structures necessary to display the screens. With traffic control, the Capri user may communicate simultaneously with as many CRTs as the basic hardware configuration can accommodate.

Messages Checked

Capri is said to check all messages coming into the CPU from a CRT terminal for appropriate data types – whether alpha or numeric – and for proper positioning within the field. Invalid data results in recycling of the screen to the sending CRT by Capri, the company noted.

Using the system, the applications programmer is not required to create special coding to save intermediate results in the event of interruption by another CRT. This, the firm emphasized, is particularly significant in a multiscreen environment.

The system written in Cobol for the Burroughs implementation and partially in BAL for the Univac and IBM versions may be purchased for $6,000 plus installation. Installation, depending on the hardware/software environment, should range from $500 to $3,000.

Universal Systems Associates is at 5003 Chowen Ave. S., 55410.

JCL Generated, Source Library Controlled by Mark IV Package

MIAMI – The Informatics Mark IV file management system has simplified programming chores at many user sites. Now, the Mark IV Job Configurator system, just introduced by Eastern Airlines, simplifies the operational side of things for at least those users under OS/360.

The Job Configurator was developed by Eastern to answer its own needs: Mark IV had become very popular with non-DP personnel, but they were utterly stymied by the rather technical linkages that had to be put together to get their projects on the air.

Error-Free JCL

Job Control Language was a stumbling block not only for the nonprofesional user but for full-time programmers as well, so the first phase of the Job Configurator was built to generate error-free JCL statements based on Mark IV programming code.

Both the "pro" and the casual Mark IV user began looking for a better way than cards to maintain their source code, and so a second phase was developed to extend the OS source library facilities – normally available for IBM-supported languages only – to include Mark IV.

Finally, Eastern saw a need to ease the actual production environment; so as a third phase within the Job Configurator, it provided an automatically initiated job stream. Functioning like IBM's Procedure Library facility, this told operators which tapes or disks to mount and in what sequence.

The software system also produces reports that reduce the clerical work required of the Mark IV coordinator, the CPU operator, tape librarian and the original Mark IV user.

Eastern is marketing the package independent of Informatics, although the Mark IV vendor is aware of, and acknowledges the utility of the system. The Job Configurator is currently available for a license fee of $6,000, which includes implementation, a year's maintenance and two days of familiarization training.

Eastern's data processing marketing staff is at the Miami International Airport, 33148.

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Service Stimulates Circuits

ENCINO, Calif. – Engineers working on computer design can examine the behavior of a digital logic system prior to its fabrication, with the remote-batch Logic Simulation Program (LSP) service from Seven-Twenty Inc.

LSP also supports asynchronous logic elements and three-valued logic simulation to give the engineer a flexible design tool. The service functions on two levels – design development, which includes LSP identification of circuit errors and other housekeeping chores; and simulation of the final design in operation.

The circuit the engineer is developing is described in specially flagged logic definition statements, while system inputs and outputs are described in their own statement forms.

LSP is available through nationwide In-Wats service, the company said, and varies from $10/min for design preparation only, to $60/min for a full simulation of the circuit after it has been designed.

Seven-Twenty Inc. is at 16200 Ventura Blvd., 91316.

Transparent Linkage

'Amigos' Files Driven by Isam Coding

ROCKVILLE, Md. – Comress Inc. has made it much easier for OS/360 users to switch from IBM's Indexed Sequential Access Method (Isam) to Amigos.

Amigos was introduced a year and a half ago as a faster-functioning and easier-to-code replacement for Isam, particularly useful for the retrieval of data from direct-access files under the system's control.

Well received by industry observers, Amigos made two demands on the user:

- Each Isam file had to be converted to a standard Amigos file format prior to execution.
- Isam-oriented coding within the application program had to be rewritten along Amigos-acceptable lines.

Now, with the introduction of the Amigos Transparency Interface (Amigos/T), Comress has cut the user's effort in half. Files still have to be changed to Amigos format, but Isam-type coding need not be modified. The interface converts the old instructions to utilize the Amigos capabilities.

Version 1 of transparency is available now as a separately priced feature to support programs written in ANS Cobol, Assembler language or PL/1 for fixed-length, blocked records. Version 2 – to be released shortly – will provide support for variable-length records, Comress said.

The conversion of files from one format to another is handled by a standard Amigos copy utility which does the job in a single operation. Job control statements must be changed for each new Amigos file, but the result is simpler JCL than required for an Isam file, a spokesman noted.

Amigos/T operates by intercepting all program-initiated Isam requests and translating them into equivalent Amigos commands. Part of the interface functions as an extension of the OPEN executor transients, so that Amigos files can be opened properly by the Isam application program, but this does not modify any of the IBM-supplied OS/360 code, he added.

The other portion of the interface operates in the user's partition or region and performs the actual translation of each Isam command. Because of its design, Amigos/T will allow an application program to process both Isam and Amigos files without any conflict or interference, Comress claimed.

Amigos normally saves from 15K to 20k of storage compared to Isam, the company said. Amigos/T adds about 4K to the requirements of the basic system.

Amigos/T adds $500/copy to the cost of Amigos, which ranges from $8,000 for a one-year lease to $17,000 for three years.

Comress is at Two Research Court, 20850.

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So far, so good. A better product at a lower price. But what about experience? Financial responsibility? National sales & service?

Fact: Wyle has been building CRT terminals for reservations and ticketing since 1967, including a $2.5 million contract to supply 1150 terminals for New York City's off-track-betting system.

Fact: Our parent company, Wyle Laboratories, has annual sales of over $90 million and assets in excess of $60 million.

Fact: Nationwide sales is provided by GENESIS ONE, one of the country's largest and most experienced computer marketing organizations with offices in 40 major cities. Also nation wide service for full customer support.

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'1130 Bigot' OKs Fortran on S/3

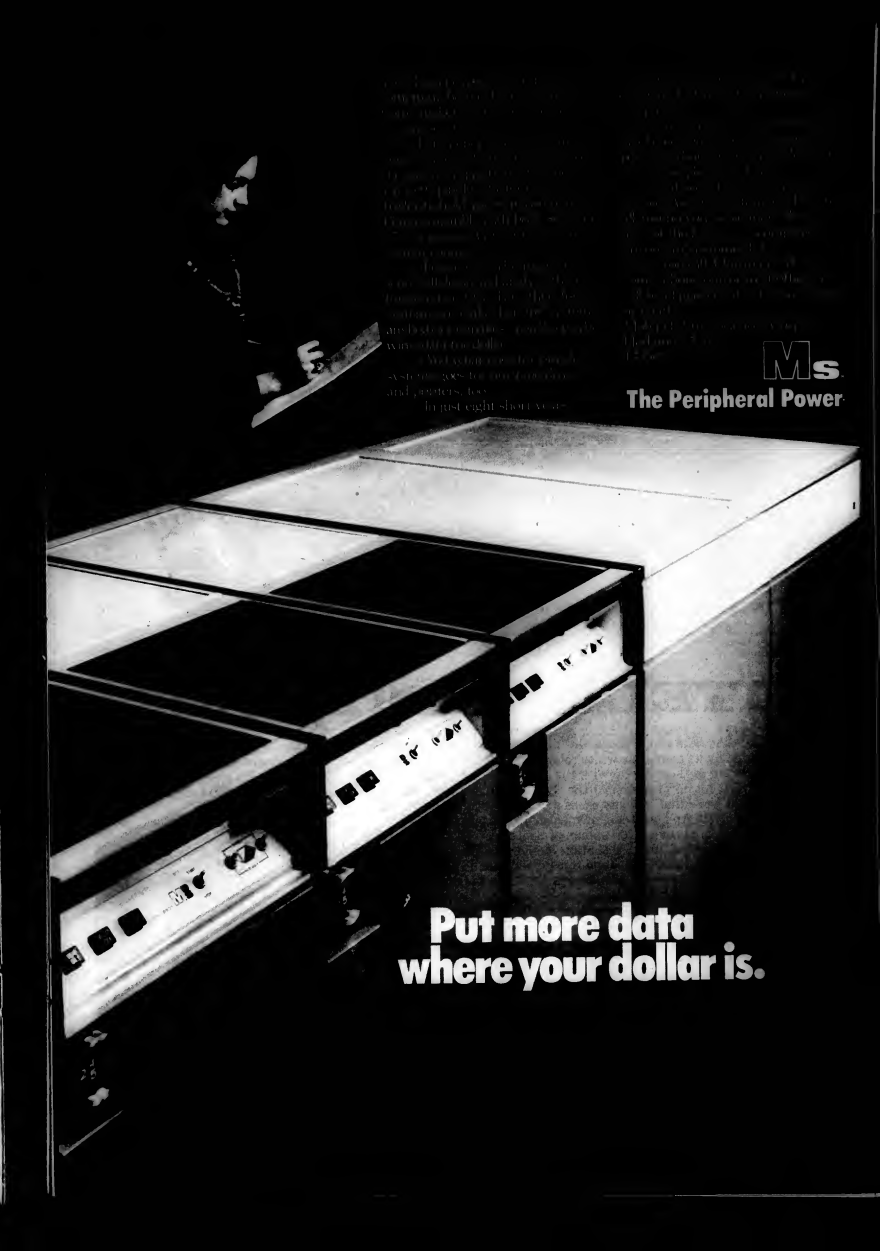
(Continued from Page 13)

moved over from the 1130 than for the average S/3 user, the user noted, explaining "most S/3 users" are business oriented, and would be I/O-bound and therefore unconcerned with processor speed. In any event, they would not normally be using Fortran anyway, he added.

The automatic rounding of floating-point number provided on the S/3 Fortran, he noted, can cause real difficulties for the 1130 user who always had to do his own rounding. Routines that include user code to round numbers have to be modified before they cause a "double rounding" effect on the S/3.

The preinitialization of dimensioned arrays at zero before they are stored on disk means the S/3 user requires more core when he wants to use the array, and this may limit the size of the array in a way that the 1130 never would, he said.

On a really basic level, several users have been irritated to find that normal 1130 object decks are in a form that cannot be read by the less tolerant reader on the S/3. Even if the program logic can be applied directly on the S/3, the program has to be recompiled just to get into the system.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Data Briefs

Numeric Cluster Pad Attaches to Terminals

SANTA MONICA, Calif. – Users of Model 33 TTYs, GE Terminets, Univac DCT-500s, Texas Instruments 700 "Silent" terminals and others can install a numeric cluster with the EIA-compatible unit from the TTS Division of Remote Data Terminals Inc.

The small keyboard connects between the terminal and the modem and provides rapid entry of numeric data for operators familiar with adding machine numeric clusters. In addition to the standard calculator format, the six control keys include carriage return and line-feed keys. On-line or local-mode operation is switch-selectable.

The numeric pad operates at 300 bit/sec but other versions are available at 100 and 150 bit/sec. The Model 33 TTY pad costs $125, while the EIA unit for other terminals costs $145. The pad can be installed by the user and is available in 30 days. TTS is at 2928 Nebraska Ave., 90404.

MDS Has Input Terminal

BROOMFIELD, Colo. – A data input terminal that collects keyboard-entered variable data and fixed data from cards or badges is available from the Mohawk Data Sciences Corp.'s Colorado Instruments Division.

The Model 4401C C-DEK terminal uses a light source and photo diodes to read card and/or badge input. The terminal is designed for hospitals, libraries, factories and other data-collection sites.

Data from cards, badges or keyboard may be entered singularly or in any combination of up to 10 transactions.

Basic monthly rental is $82.50 on a one-year contract. MDS is at 1 Park St., 80020.

Quindata Upgrades Quintypes

MOUNTAINSIDE, N.J. – Quindata, Inc., has introduced the Quincom-1, a data-communication terminal for use with the Quintype-70 and Quintype-80 automatic/revision typewriters.

The terminal operates over the dial-up phone network or dedicated lines and can transmit to a CPU, terminal or other Quintype system.

The Quincom-1 can be used with an acoustic coupler or data set at transmission speeds from 110 bit/sec with the typewriter to 300 bit/sec with tape-to-tape. The terminal costs $2,200. The firm is at 1011 Rt. 22, 07092.

ICC Guides Users

MIAMI – International Communications Corp. has issued a free guide to data communications "buzz words" for both beginning and experienced communications users.

The guide is available from ICC at 7620 N.W. 36th Ave., 33147.

5,000 Different Models

Data Base Analyzes Network Needs

By Ronald A. Frank
Of the CW Staff

RANDOLPH, Mass. – Users who want to objectively select the best communications equipment to fit their needs can now access a data base of information on more than 5,000 different models from 490 vendors.

Users can outline their requirements for such devices as modems, multiplexers, terminals, front-end processors and receive a printout of the available products.

The product data base has been compiled over a 15-month period by System Architects Inc. (SAI), a communications consulting firm. The goal of the service will be to give users the latest information in specific communications product areas.

$10 Search

In a typical case, a user will request information on the available 4,800 bit/sec modems and receive a printout listing the models, together with features and prices. Such a search would cost about $10, an SAI spokesman said.

For users who want additional information, SAI will use simulation software to pinpoint the equipment that will perform best in the user's network, at additional cost. Such an analysis would cost about $1,000, the spokesman said. Full network configurations can also be determined, he said.

The data base will be continually updated to reflect the latest announced products. At present, SAI provides users with a printout generated by a PDP-10 operating on the Interactive Sciences Corp. time-sharing system, but eventually the information will be stored on an in-house system, an SAI spokesman said.

POS Data

In addition to data equipment, SAI will also provide prospective users with the latest available data on point-of-sale systems, data-entry devices, voice response and remote-batch terminals.

When a user requests a printout, he submits a DP-type questionnaire. In the case of a full communications system, the customer will cover data about his entire network.

Included will be such categories as the man-machine interface (types of front end and other CPUs); intelligence (size and type of memory); communications disciplines (concentration, multiplexing, code conversion); line configurations (transmission speeds, interfaces conditioning) and financial information detailing whether his equipment is leased or purchased and the associated costs.

This total information will then be analyzed to find the best cost/performance solution for the user.

A typical search of available products in one category should take 24 hours, a spokesman said. Information about the service is available from System Architects Inc., 45 Diauto Drive, 02368.

Three 1108s Provide Switching For TWX and Telex Customers

MIDDLETOWN, Va. – Western Union has officially unveiled its Telex and TWX message-switching center to service more than 80,000 terminals at subscriber locations.

The center operates with three Univac 1108 mainframes, three smaller Univac 418 III communications processors and 12 C2000 front-end multiplexer/preprocessors designed by Teleprocessing Industries Inc., a WU subsidiary.

Called the Information Services Computer System, the center is operated by Teleprocessing Industries and can handle up to 250,000 message/day. Peripherals supporting the CPUs include 30 drums, 35 mag tape drives and 75 teleprinters.

TWX messages arriving at the center in 4-wire format are sent through TWX interfaces and translated to 2-wire form. The messages are then routed through automatic answering equipment to a C2000 preprocessor/multiplexer.

Backup Processors

Messages from the C2000s are sent into the 418 III CPUs which group and block the information for entry into one of the 1108s. The mainframes format, store and forward the messages to their proper destinations. Two 418s and 1108s are on-line at all times with a third used for backup and batch processing.

Included at the center is the ability to interface TWX and Telex messages, thereby allowing a subscriber of one service to reach a terminal connected to the other service.

Messages to the center are received on 6.3 GHz microwave channels that are part of the WU transmission network.

The center also handles international messages being sent to domestic sites, and traffic for Western Union's other communications services. Military and other government communications traffic may be added later.

Operator Scheduling Eased

WATERBURY, Conn. – Telephone companies can improve the scheduling of their operators, ease the work of the directory assistance personnel and work towards leveling the loads carried by smaller offices, through the services of Automated Business Systems Inc. (ABS).

Working with projected call volumes, ABS forecasts the number of people required for a given period for any telephone office. It provides all the details needed by a central office clerk in preparing assignment sheets, ABS said.

ABS supports the accumulation of data on phone numbers receiving heavy traffic and prepares Frequently Called Number Lists for directory assistance personnel.

ABS is at 999 Chase Parkway, 06708.

Honeywell Adds Bank Units

WELLESLEY HILLS, Mass. – Two electronic teller terminals for banking institutions have been introduced by Honeywell Inc.

The teller terminals are designed for passbook savings accounting at savings banks, savings and loan associations, credit unions and commercial banks.

The teller terminals are the Type 7330, a fixed sequence terminal and the Type 7340, a programmable sequence terminal. Both units cost about $230/mo.

Transcom Terminal Said to Save 28% Compared With IBM 2721

WINDSOR LOCKS, Conn. – Transcom Inc. has introduced an alphanumeric portable terminal that can communicate with an audio-response-equipped CPU.

Designated the IT-160, the terminal is said to be 18% to 28% lower priced than the comparable IBM 2721 terminal. The terminal has 65 keys, five of which are used to perform local functions such as testing the batteries of the device. The remaining transmission keys can be modified for special control codes as required by the user.

The audio volume is adjustable and earphones can be used for security or in noisy locations. The IT-160 uses an acoustic coupler on the remote end and a Bell 401J or independent equivalent modem on the computer end of the link.

Three models are available ranging from $435 to $490. The terminal can interface with most audio-response units including the IBM 7770 system, Transcom said. Battery and AC units are available.

In a typical application, alphanumeric data is keyed in to a CPU and voice-response answers are received by the operater via the terminal's speaker. The IT-160 handles ABB code which is an extension of the Touch-Tone code set, Transcom said. The firm is at 580 Spring St., 06096.

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Will Users Need DP Planning?

AT&T Will 'Study' Dual Rates on Private Line Routes

NEW YORK – After lengthy, informal discussions before the Federal Communications Commission, AT&T is ready to ask bulk channel data and other users what they think about proposed changes in private line rates [CW, June 14, 1972].

The Bell System marketing studies will be based on the so-called Bulk Rate Plan 6 which would designate high-density and low-density private line rates. In addition, local phone companies would no longer help the user in configuring the least costly network. The changes could mean that all new network configurations would require computer analysis.

If AT&T decides to formally file a tariff for the rate structure proposed in Plan 6, it presumably would have to receive favorable comments from prospective users during its marketing trials, which are expected to last "from three to 12 months."

Change Possible

While heavy users of private lines have always enjoyed bulk discounts from the Bell System, the new rate structures could change that. Plan 6 would reportedly make it more expensive to operate large networks outside urban areas because of the more favorable rates in the high-density cities.

The plan will reportedly include lower rates for users with routes between high-density centers. But this is not yet clear, and hopefully the AT&T marketing studies will hint at the new rates.

Previously, the user configuring a communications network had only to select the shortest route miles to optimize his monthly charges, but under the new plan the high/low density rate differential will make network optimization more difficult.

Will Need Computer

"It is almost a foregone conclusion that the user will have to utilize a computer to optimize his network," one observer said. While there have been several network analysis services and programs in the past, these software systems will have to be drastically overhauled to operate with the proposed AT&T rate structures.

Adding to the user's problems is AT&T's apparent intention to stop offering network planning assistance to its private line customers. Up to now private line rates have been pegged to a flat rate per mile per month and local phone companies have assisted users in planning the optimum network.

Although AT&T has announced the marketing studies, exact implementation of the program has not yet been made, according to an AT&T spokesman.

"Several levels of rates are being considered. The studies will be designed to determine the level at which the [private line] service will make its optimum contribution," the spokesman said.

The next informal meeting in the series of discussions is planned for November – indicating that the informal Washington discussions will continue along with the AT&T studies.

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EMR Data System Includes Turnkey CPU, Peripherals

MINNEAPOLIS – EMR Computer Corp. has introduced the 6140 "Mission Matched" hardware/software system for data communications users. The system includes a full line of peripherals and the EMR Asset operating system which is described as a real-time multiprogramming software system.

The 6140 processor has a capacity of up to 32K 16-bit words, seven direct memory access channels, 40 addressable interrupts and 16 levels of memory protect.

In a communications environment, the 6140 can interface with most major mainframe CPUs and can operate as either a message switcher or a line controller, the firm said.

A full range of peripherals is available with the 6140 including disk, card, mag tape, plotting and communications devices. A typical turnkey system with a 32K word CPU, fixed-head disk, card reader, mag tape unit, line printer and Asset software would cost about $200,000, a spokesman said.

Included in this configuration would be the 5605 message communications line controller which can handle up to 64, 4,800 bit/sec lines in half-duplex mode.

The 5605 can handle data speeds up to 230 bit/sec and is compatible with a full range of line interface units, the company said. The 5605 is also available as an add-on device for present users of the EMR 6145 system. It costs $23,000 and will be available in the first quarter of 1973. The 5605 and the 6140 are compatible with IBM systems via an applications software package that is priced separately.

EMR is at 8001 Bloomington Freeway, 55420.

SYSTEMS&PERIPHERALS

Bits & Pieces

Century 200 Users Offered New Heat Impact Terminal

DAYTON, Ohio – NCR Century 200 users will soon be able to use a new thermal data terminal as their I/O writer, and install a second remote I/O writer.

The thermal data terminal features heat-activated printing rather than the standard mechanical-impact printing. Printing speed is 30 char./sec over an 80 character line.

The thermal data terminal is available for retrofit on systems currently equipped with teletypewriters. Concurrently NCR is offering both thermal units and teletypewriters as remote I/Os. New thermal terminals cost $2,400 or rent for $50/mo, plus a one-time conversion and installation cost of about $450.

A remote thermal unit costs $7,400 or rents for $175/mo. Deliveries on the new equipment will begin in January.

MOS Replaces TTY Logic To Form Basis of A/D Converter

CANTON, Mass. – By using C/MOS – instead of TTL logic – the Model 256 Analog-to-Digital Converter promises improvements in size and cost without sacrificing speed or accuracy, according to the manufacturer, Datel Systems Inc.

The 256 Data Acquisition/Distribution System is plug-to-plug compatible with most minicomputers and can be used either to convert analog input to digital output or digital input to analog output.

A typical system, consisting of 256 channels for multiplexing, sample and hold, 12-bit A/D converter, power supply, front-panel display and controls plus cards costs $4,400. Delivery is four weeks from receipt of order from 1020 Turnpike St., 02021.

Varian Offers High Speed Transport

IRVINE, Calif. – Varian Data Machines has a new high-speed 9-track magnetic tape transport with read-after-write capability.

The Model 620-32 operates at 37.5 in/sec. and performs cyclic and longitudinal redundancy checks. The unit with controller costs $9,000. Additional slave units, up to four per controller, cost $7,000 each from the firm at 2722 Michelson Dr., 92664.

Optimedia Introduces New Line

WORCESTER, Mass. – Wright Line has introduced a new binder storage system including cabinets and job-tailored data storage binders. Optimedia binder storage cabinets are available in heights of 31, 37, 58, 71 and 84 in.

A fully configured cabinet costs about $500 from the firm at 160 Gold Star Blvd., 01606.

User Tells All

Brownouts 'Like Russian Roulette'

By a CW Staff Writer

JAMAICA, N.Y. – Voltage fluctuations can be caused by more than just the electric utility serving a computer installation, and a user's own power needs must figure in site planning.

Although the several brownouts this summer have come mostly from high usage of air conditioners or from failures within electric utilities, users could look much closer to their computers and find potential problems.

John Krauss Inc. is a case in point. The large meat-packing firm has three slicing machines that use a total of 270 hp, and they "compete" with an IBM 360/30 for voltage.

Two 85-hp and one 100-hp motors are essential to producing a "product," but the 360/30 is essential for producing bills, as well as payroll and other routine applications.

The company's electric system is built to handle normal operations, but the combination of motor start-up, which uses more power than continuing operation, and inconsistent performance of the electric utility could be severe, according to DP Manager Anthony Mazzola.

The addition of in-house voltage regulation equipment has solved the problem of constant voltage to the sensitive equipment, although he is still susceptible to blackouts, Mazzola noted.

He also likened his situation to a "Russian roulette" game, noting he had eliminated the "most possible problems." Buying every type of power equipment on the market could be so expensive he could run himself out of business, he commented.

For less than the monthly lease on his 360/30, he purchased the voltage regulator, he continued.

The 360/30, like most computers, is equipped to handle voltage drops of 8%. Last year, however, the combination of a 5% brownout and the slicing machine start-up reduced voltage from 208 to 169, or almost 20%, according to Mazzola.

Having already installed the regulator, the voltage to the computer remained a steady 208, Mazzola related, even though the incoming voltage to the device, a Solatron line voltage regulator, was far below acceptable levels.

Mazzola said power fluctuations – brownouts – cause two types of problems, depending on their duration. An extended brownout could lead to head crashes, while a less noticeable voltage drop could lead to data errors.

If a voltage drop occurs during a write routine, he explained, there could be errors in data which lead to longer-term errors in bills, and lost revenues.

The company cannot afford to have billing or payroll errors, he noted.

The Solatron unit is an electronically controlled autotransformer, according to the manufacturer, Sola Electric, a division of Sola Basic Industries. It was installed on-line, between the incoming power panel and the computer.

One day last summer, when Consolidated Edison notified his company that a brownout would be imposed, Mazzola had a measurement system set up to obtain readings on the unit and on voltage to the computers.

The brownout itself would take the voltage down to about 195, but then starting up the motor on a slicing machine drove it down to 169 V, he related. Even so, the voltage to the computer remained at 208, and business was normal, Mazzola said.

The situation has been repeated many times this summer, he added.

Users Offered Non-IBM Source Of System Maintenance Service

NEWTOWN, Pa. – Both U.S. and European computer users are getting a new non-IBM source for complete system maintenance with the recent announcement that Computer Hardware Consultants & Services (CHCS) Inc. will begin offering such services.

With the founding of Computer Hardware Maintenance Co., Inc., under the direction of John M. Curley, the firm is now going after the complete system maintenance field for end users.

In addition to CHMC in the U.S., the firm also announced the establishment of the CHCS European Trading Corp. under the direction of Marvin R. VanDam to offer similar services to European users.

The firm said it plans to establish maintenance facilities in "a number" of U.S. cities to provide the systems maintenance services.

All of these facilities will be equipped with technical experts to back up the customer engineer on site for difficult problems that he cannot handle.

The technical experts at the centers in major cities will be used to help the CE solve the 10% of problems that he cannot handle on his own, he indicated.

While Melrose could not estimate the number of service centers that would eventually be operated by the firm, he noted that it presently has facilities here and in Anaheim, Calif., Itasca, Ill., Dallas and Toronto, plus the new ones planned in Paris and Frankfurt, West Germany.

To increase the number of CEs available to the firm, the firm has also started an in-house education facility to train personnel from the ground up, with approximately four-month courses for each piece of equipment the engineer will be called on to maintain.

Add-On Promises Cost Saving

EL SEGUNDO, Calif. – With most vendors trying to convince users to replace their IBM memories with semiconductor add-ons, Data Recall is offering an alternative: a new completely core add-on memory that includes, in addition to comparable speed, lower power requirements, higher density, reduced costs and a service feature called "deferred maintenance" according to the firm.

Deferred maintenance allows users to trouble-shoot and bypass a module containing a malfunctioning component.

If a problem occurs with an address in one of the 128K increments, the user can switch another increment in the system to take its place by changing pin settings at the back of the chassis.

The ability to switch address locations should make it possible to keep the system operating until the field service staff can replace the malfunctioning module, thereby deferring maintenance, the firm stated.

Packaged in 64K-byte modules with all solid-state circuitry and components self contained, the Data Recall memories operate at 850-nsec cycle time and 350-nsec access time.

A single 64K-byte module, when packaged with its electronics, measures 1.2 in. by 16.5 in. by 11.75 in. Thus, a single Data Recall cabinet for a 370/155 can contain all 2M bytes, and a single cabinet for the 165 can contain all 3M bytes. Both cabinets are equivalent in overall dimensions to the IBM 3360 cabinets, but have a memory capacity of four to six times greater than the 3360, the firm stated.

Interdata Has Trade-In Deal

OCEANPORT, N.J. – Interdata is offering a 25% trade-in allowance against the single-unit price of the Model 70 processor for users who exchange their Model 3 or Model 4 minis.

The Model 70 is a 16-bit machine with hardware multiply/divide, 32-bit floating point, 16 general registers of which 15 can be used for indexing, solid-state LSI ROM, 255 automatic I/O channels and built-in TTY interface. With 8K bytes of core memory the Model 70 costs $6,800. With the trade-in of an operating Model 3 or Model 4 with 8K bytes of memory, the price of the 70 is $5,100.

The 25% trade-in offer expires Dec. 31, from 2 Cresent Place., 07757.

We now have the inventory to handle any customer request for core stacks. We can supply you with a wide range of proven designs, options, components, and electronics straight off the shelf. Our stack sizes range from 4K x 18 to 131K x 80. Organizations include 2-wire/2D, 2-wire/2 1/2D, and 3-wire/3D

Now. Custom Core Stacks. Commit them to your memory. If we haven't got it, we'll make it. Starting with our uniformly superior roll-cut cores in sizes from 14-mil to 30-mil. Call us for a custom stack that's compatible with any system. Call us for the system packaging to put it in, too. You'll get custom attention. And you'll get exactly what you need. Call today.

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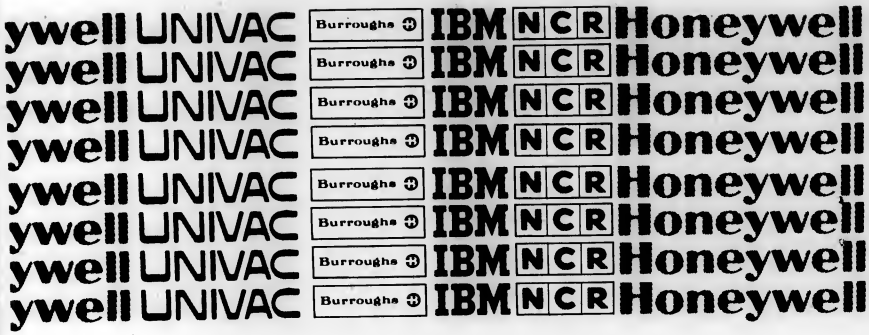

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Data Entry System

'Mini-Key' Said to Beat Keypunch Price

WELLESLEY HILLS, Mass. – A new data entry system from Keane Associates Inc. is claimed to offer better performance and cost less than keypunch or key-to-disk systems.

The Mini-Key system, which starts with a basic configuration of four key-entry stations connected to a central data storage unit and leases for $640/mo, has facilities superior to buffered keypunches at a cheaper per-station cost, the firm stated.

Compared to key-to-disk systems, Mini-Key systems are 40% less costly in a minimum configuration and have comparable features including extensive operator assistance features; automatic skipping, paging and duplicating; random record search; insertion and deletion; and expansion capabilities not possible in shared processors, Keane claimed.

The Mini-Key System

While key-to-disk systems have a central minicomputer which controls the operations of surrounding I/O terminals, the Mini-Key system has "intelligent" terminals that only use the central unit for storage and converting cartridge information into computer-compatible tapes.

Each station is provided with 4K internal semiconductor memory to allow each station to monitor its own operations so it is not time-dependent on a minicomputer.

Data is entered from a CRT terminal keyboard which can be configured either as a typewriter or keypunch. As data is entered, it is processed by an internal microprocessor enabling each station to have format control and perform arithmetic operations independent of any other part of the Mini-Key system.

If data is entered incorrectly, the microprocessor will inform the user through the CRT display that an error has occurred, and at what line and location within the line the error occurred.

If the data entered is in correct form, it is displayed on the station's 5-in. CRT and simultaneously written on one of the two cartridge subsystems. One cartridge subsystem is used for permanent data entry while the other is for editing.

Any data from the permanent cartridge can be transferred to the temporary cartridge. This allows data to be displayed on the CRT and edited using the microprocessor. This corrected version can then be replaced over the incorrect data on the permanent cartridge.

Each cartridge can contain 600 variable-length record lines of a maximum of 120 characters each. The microprocessor provides for read-after-write, character record check and phase checks. Tape speed is 40 in./sec during rewind or tape search.

At any time, a station can transfer data to the central storage unit where it is rewritten on 1/2-in. computer tape. The central tape storage unit records data in either 7- or 9-track format on 7-in. reels.

Recording density can be either 556 or 800 bit/in. recording density with tape speeds of 12.5 in./sec, and a transfer rate of either 6,950 or 10 byte/sec. In this form data can be directly entered into any standard computer.

The firm is at 36 Washington St., 02181.

Software for Prime 200 Minicomputer Specified Before Hardware Designed

NATICK, Mass. – The common practice in the small computer industry is to build the hardware first and then design the software. Prime Computer Inc. claims a first with its Prime 200 minicomputer – its software was completely specified before the hardware was designed.

Software capabilities include disk operating and real-time systems, a Fortran IV compiler and micro-diagnostics for system analysis and fault detection.

The Disk Operating System incorporates a file management facility with multilevel file directories, multiple-volume control and file-access methods.

DOS supports compressed Ascii files, and thus provides about a 5-to-1 reduction for Assembly language files and about a 4-to-1 reduction for Fortran files, the firm stated.

A Real-Time Operating System can be used to provide interrupt handling, multiprogram scheduling, simultaneous I/O and general supervisory functions.

The stand-alone system provides a Fortran IV compiler, macro-assembler, desectorizing link loader, a support library of Fortran functions, a math library and I/O drivers.

Fortran IV, the programming language for the Prime 200, executes in one pass producing optimized code.

The micro-assembler has standard coding simplifications and other standard features on symbolic assemblers as well as a statement format feature for developing macros.

Other software features include edit and debug-resources, desectorized link editor, I/O control system, run-time packages and verification and maintenance features.

The Prime 200 uses 100% MOS semiconductor memory with basic memory of 8K 16-bit words and expandable to 32K. The CPU has a cycle time of 750 nsec and comes with eight direct memory access (DMA) channels.

Microprogrammed Logic

Hardware utilizes complete microprogrammed logic and features a 64-bit wide microprogrammed word. The Prime 200 offers parity on every byte of information on every data path.

The $7,100 basic system includes a CPU of 8K word memory, eight DMA channels, asynchronous serial communications interface, programmers console and a 64-level vectored interrupt system with an extension capacity for eight additional circuit boards. First shipments are expected in November from 17 Strathmore Road , 07160.

Tapes made on Novar off-line source data devices, including the 5-30 Automatic Tape Typewriter and 5-12 Recording Typewriter, can be transmitted via telephone lines by playing them on Novar 5-50 or 5-60 communication terminals. The 5-50 transmits in the Selectric correspondence code, the 5-60 in the ASCII code. Transmission rates available up to 2400 bits-per-second.

GTE INFORMATION SYSTEMS INCORPORATED
2370 Charleston Road
Mountain View, California 94040
(415) 966-2272

The Novar 5-30 Automatic Tape Typewriter and the 5-12 Recording Typewriter are designed for use in multiple machine instaliations where all units must be able to prepare tapes, but transmission of the recorded data can be handled by one or several Novar communication terminals—such as the models 5-50 and 5-60. Highly efficient installations that also save a lot of money.

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Manufacturer Finds His Profits Increase By Getting Accurate Information Fast

By Marvin Smalheiser
CW Correspondent

SAN FRANCISCO – "The name of the game is to sell and ship as much as you can with as small an investment in inventory as possible," said Fred Knauer, owner of a curtain-manufacturing company. A small computer can be an "extremely important factor" in accomplishing this goal, he added.

Ordering the right fabric at the right time is the key step in inventory reduction, he indicated, with quick, accurate information playing a major role in ordering.

While reporting only "minor" savings through personnel reduction, Knauer, president of Western Curtain Manufacturing Co. (WCMC), said: "We have saved $25,000 a year above the savings of personnel and the cost of the machine, by simply getting accurate information quickly."

Knauer said his Singer System Ten had suffered a "minimum" of downtime, and even this problem was "primarily because we bought the machine so early."

The original workstation, he explained, was "not built sturdily enough to handle the kind of pressure it took. The Friden Division of Singer replaced the workstations at no charge," he stated.

Knauer said he feels the system has been justified. The initial decision to try System Ten was because it was "the only one that was basically designed for our level of operation, volume-wise and in sophistication.

"We decided that we were wiser to go into System Ten even though it hadn't been tested than to go into a system that had been tested and proven but yet was not really adequate for our needs."

Now, "the system has enabled us to compete with our larger competitors" and tightened up all aspects of the operation, "enabling us to make greater profits with virtually the same volume."

The System Ten Model 20 has 40K of central core memory, and two disk drives.

The system is connected to two workstations in a bullpen area only a few steps from the offices of the company's chief executives and shares space with an antique radiator.

The Model 70 workstation includes typewriters which establish two-way communication with the CPU for input, validation and output, although most of the output is on a 110 line/min printer, also in the bullpen.

Input into the workstations will detail information about a customer, plus width, color, pattern and size of an item ordered as well as pricing, lot number and quantity of units.

Information on pricing and customer identification is among the data validated on-line by the system.

The order-entry system produces a work ticket and is set up to reduce piece goods inventory or the finished stock inventory.

The workstations are also used for billing when the order is about to be shipped.

There is also a report on accumulated sales on a monthly and fiscal year basis for style, color, size, etc., plus a report on the volume of business, and another report covering salesmen's commissions.

Knauer said reports from the

The Small Systems User

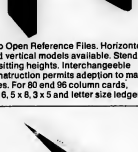
system "save us between four and five times the cost of an employee just by giving information to the management of the company that it was never able to have before."

The potential of the system, Knauer said, will enable WCMC to add additional workstations of special equipment for regulating production, and for evaluating production costs for each worker.

The custom programs that were instituted," Knauer continued, had to be changed and that caused us a certain amount of inconvenience.

"The downtime on the system, while it has been inconvenient, has been compensated for largely by the excellent service we have gotten from Friden."

Operator Linda Holdaway enters data to Singer System Ten through the workstation, at Western Curtain Mfg. Co.



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Industry/Society Differences—Analysis

Ralston Questions JCC 'Service to the Membership'

By Edward J. Bride
Of the CW Staff

MONTVALE, N.J. – The computer industry this year said it wanted just one national computer show a year. It got what it wanted, in the form of the 1973 National Computer Conference and Exposition (NCC).

But apparently the computer societies are now saying the 1973 switch was too soon, that there is not enough time to plan a broadly based meeting and that New York is a bad place to hold such a show.

Between these two views is the American Federation of Information Processing Societies – a group of groups, not of people – the sponsor of the national conferences.

Concerned over diminishing support from exhibitors and attendees, Afips formed a special committee, the Industry Advisory Panel, to decide how the conferences could be rearranged to attract more people.

Summarily, the IAP decided the attendance base needed to be broadened, and this could be accomplished by asking user-oriented groups to participate by planning special seminars.

The goal of more people and more money may be a false one, according to Dr. Anthony Ralston, president of the largest Afips group, the Association for Computing Machinery (ACM).

False Goals?

Fully one-third of the technical program of recent joint computer conferences has been planned by ACM members, and now Ralston has second thoughts about participation.

In a recent exchange of letters with Robert Forest, chairman of the IAP, Ralston indicated that computer "trade shows" might be the outcome of these changes, and that Afips should not be in the trade show business [CW, Oct. 11].

'Serious Problems' Ahead

Broadening the conferences to benefit end users – the buyers – was the IAP re-

Societies/ User Groups

commendation adopted by Afips and the JCC board, but Ralston said the reorientation of the conferences poses "serious problems for ACM and the other constituent societies."

"It is not obvious . . . that such conferences will continue to provide enough service to the membership of ACM to justify our efforts and those of Afips in sponsoring them," Ralston said.

It may be "neither appropriate nor viable for Afips" to sponsor "the kind of conferences which the NCCs will become," he said, adding that the ACM posture is not necessarily fixed on this issue.

Agreeing with Forest that the technical societies and commercial interests should seek closer relations, Ralston said "this is not, cannot be and should not be a primary focus for a technical society."

On the other hand, Ralston said the only way technical societies can increase their influence on government and society is by maintaining independence from industry.

Meager Market

Ralston further explored Forest's opinion of Afips as the only chance to "reach out beyond the meager and insignificant market represented by the members."

This could be accomplished, Forest contended, by having other groups plan the technical program since currently the people who develop the technical conference program "do not understand the problems of the average user."

The ACM "does not understand or deal with the real world of the end user. It is incapable of developing programs or sessions of interest to the average user," he stressed.

Ralston challenged Forest: If this is true, then it is "illogical" to contend that Afips can provide the market sought by industry.

Furthermore, Forest's "refurbishment" of the conferences would effectively ignore the societies, Ralston contended, and "will certainly turn the conferences into trade shows."

"I have nothing against trade shows," Ralston said, "but they are a business and I doubt, as I think you do also, the ability of Afips or any of its constituent societies to run any business, and certainly this kind of business, particularly in the face of likely competition."

Afips said the exchange of letters was a personal matter between Forest, editor of *Datamation* magazine as well as IAP chairman, and Ralston, computer science professor at the State University of New York at Buffalo.

Officials noted that differences in priorities would always exist between industry and society.

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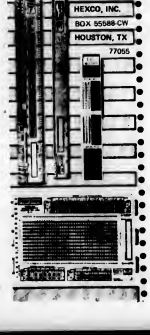

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Jobless DPers May Attend Seminars At Cut Rates to Keep Up With Concepts

NEW YORK – The Association for Computing Machinery (ACM) will now let unemployed DPers attend its Professional Development seminars at student rates, on a space-available basis, so they may keep up with current concepts without undue financial strain.

The seminars are one-, two- or three-day courses, presented in a series of cities, and open to ACM

Education

members and others, at costs the association said are lower than commercially run seminars. Fees for the students – and now, the out-of-work professionals – are $35 (one-day), $50 (two-day) and $65 (three-day session), an ACM spokesman noted.

This fall's seminars include sessions on:

- Systems performance measurement and analysis.
- Advanced data structures.
- Cost-benefit analysis for DP projects.
- Advanced programming management.
- Formal definitions of programming languages.
- Advanced program design.

The two-day seminar on measurement will be led by Dr. Jan Prokop, adjunct professor at American University. It will be presented in Washington, D.C., Houston and Montreal, having already been offered in New York.

Dr. Paul Oliver, staff scientist at Univac, will instruct the advanced data structures seminar, which will make two-day stands in Chicago, Boston and later New York, after starting in Washington.

The cost-benefits course, lasting three days, has S. Lawrence Prendergast of NGP Associates as its leader. From New York, it will go to Atlanta, Chicago and Washington, D.C.

Prendergast will be joined by Thomas Gildersleeve in presenting the two-day workshop on advanced programming management, which will tour Chicago, Atlanta, Washington, D.C., and New York.

Language Sessions

The language definition sessions, one day each, will end at the FJCC in Anaheim, Calif., in early December, after stops at Washington, New York and Houston. Instructors will be Dr. John A.N. Lee, advocate of a standard for Basic, and Dr. Robert W. Taylor.

Cobol will be the main language used to illustrate the advanced program design two-day workshops, which will be available in New York, Montreal, Kansas City and Albuquerque, N.M., under the leadership of Michael Jackson, president of his own consulting firm.

The Professional Development program is being coordinated by Richard Kiel, at ACM headquarters, 1133 Avenue of the Americas, 10036.

Davis, Hammer Spark $15 JPL Conference

PASADENA, Calif. – Dr. Ruth M. Davis of the National Bureau of Standards will moderate a panel debate on "mini- vs. maxi-computers" as part of a one-day $15 conference on advances in computing, to be held Friday, Nov. 3, at the Caltech Beckman Auditorium.

Dr. Carl Hammer, director of computer science at Univac, will also speak at the program, which is cosponsored by Caltech's Jet Propulsion Laboratory and the National Aeronautics and Space Administration in cooperation with the Association for Computing Machinery.

Topics beyond the mini/maxi debate will range from computer networks to the use of computers in medicine. Speakers will include Julius Aronofsky of Southern Methodist University, Thomas Bell of the Rand Corp. and William Yamamoto of George Washington University Medical Center.

The Office of Computing and Information Science at JPL, 4800 Oak Grove Drive, is handling arrangements and registrations.

Civil Servants' Session To Study Storage Systems

CHICAGO – A three-day course on "Storage and Retrieval Techniques" developed for the U.S. Civil Service Commission by Dataflow Systems Inc., Bethesda, Md., will be presented here in late November for DPers from local, state or federal government agencies.

Scheduled for Nov. 27 – 29 the course will be heavily "game"-oriented to encourage participation and interaction by the attendees. Concepts presented will be independent of any given hardware, and group discussions are expected to help the "students" see that good solutions to problems may differ from optimum solutions.

Registrations are being handled by the Civil Service Commission's Bureau of Training, 610 South Canal St., 60607.

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Centralized Record System

Army Gets 'Jump' on Payroll

INDIANAPOLIS, Ind. – Regardless of changes in soldiers' status or pay preferences, the U.S. Army is keeping up with them, and issuing the correct checks with help from a centralized computer pay/financial record system.

Not only do soldiers have more options on how they can receive their pay, but the centralized system, Jumps, has made it possible for the Army to maintain prompt reporting of financial information.

"It used to take us up to 45 days to get our complete figures in from locations around the world. We can now supply this information in four to five days. There is more efficient auditing with a centralized system," noted Col. William R. Sterling, director of DP at the finance center.

The Jumps system, based on four Univac 494s, each month disburses almost 800,000 checks and handles about 2.5 million requested changes which affect pay or financial records.

In terms of numbers, the Army has a complete turnover of personnel every two years; personnel are scattered around the world and their assignment at a particular location may last for only a few days; 195 stations around the world report changes; and there are nearly 40 items which could affect each active soldier's pay or financial record.

Jumps allows the soldier several new payment plans/options. He can get twice monthly pay; be paid by check or by cash; he can let his money accrue by not taking payment; or he can have the paycheck sent directly to a bank of his choice.

Under each of these options, there are additional options. He can take his pay twice a month and then change to once a month as often as he wants; he can get paid in cash one time and check another.

Jumps was even able to keep up with one soldier who had 90 changes in a four-month period. It seems the soldier was going from temporary duty back to active duty about every other day. "That caused us a little problem," a staffer said, "but I guess nothing will surprise us too much anymore."

Security Service Sharpens Surveillance

NEW YORK – A security service here is using a computer to monitor property of several subscribers, in an effort to sharpen its surveillance procedures.

Tampering with doors or windows by unauthorized persons is detected by each subscriber's control instrument on the premises, which sends a signal over a dedicated phone line to a computer at Holmes Protection, Inc. There a warning is flashed on a CRT screen on a control console, alerting an operator who dispatches an armed guard to the location, and also calls the local police precinct.

The system can store information on times a subscriber enteres his premises, proper codes used for opening the premises, possible alarm conditions, etc. It can also signal subscribers when they have forgotten to secure a safe or vault, or when they have neglected to lock a window or door.

Use of the computer reduces the "chance of human error in the monitoring of alarm systems" and enables us to check a subscriber's security much more frequently," according to Vice-President Robert Conklin.

The system, under development for three years, is designed to handle more than 8,000 subscribers, according to the firm.

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CI Notes

IBM, Telex Bids Vetoed

MINNEAPOLIS, Minn. – The U.S. District Court for the District of Minnesota has denied IBM's motion for summary judgment to dismiss the Telex antitrust suit. The court also denied the Telex motion for preliminary injunction to prevent IBM from continuing alleged "predatory" actions.

Tentative date for a trial on the merits for permanent injunction and the treble damage suit is estimated by Telex to be early 1973.

AM Forms New Unit

CLEVELAND – Addressograph Multigraph Corp. has formed a Data Systems Division to concentrate on the transaction systems market. The unit will consist of the firm's Data Systems Technology Center, the Documentor Division, a sales and service organization, and the former Addressograph Division's data systems product lines, including credit cards, data recorders, optical scanners and electronic transaction terminals.

The transaction market is pegged at $1 billion currently, according to President Charles L. Davis, and is forecast to reach $3 billion in the next five years.

Supershorts

General Motors, which placed the first commercial order for a Control Data Corp. Star 100 system, has cancelled that order. Reports indicate the auto maker has been having difficulty with the computerized research system into which the Star 100 would fit.

– – –

British Overseas Airways Corp. will market the optical reading products of Datatype Corp. in the UK and to the airline industry worldwide outside the U.S.

– – –

The U.S. General Accounting Office has denied the protest made by Computer Investors Group against the U.S. Army's award of IBM 360/30 add-on memory systems to Cambridge Memories.

– – –

Itel Corp.'s new 7830/7330 Disk Subsystem is in full production at its Information Storage Systems (ISS) Division.

– – –

Digital Development Corp. has delivered its first 7600 Series high-speed memory system.

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The 26th annual Northeast Electronics Research and Engineering Meeting (Nerem) takes place in Boston, Nov. 1-3, sponsored by the Institute of Electrical and Electronics Engineers.

– – –

IBM was presented the President's "E Star" Award in recognition of its continued outstanding achievements in promoting sales of U.S. products overseas."

Export Committee Reports

Action Needed to Keep U.S. Ahead

WASHINGTON, D.C. – The U.S. must take "prompt, positive as well as remedial action" to maintain its status as the worldwide computer industry leader, warned George H. Geick, chairman of the National Export Expansion Council's Industry Advisory Committee on Office Machines and Computers.

The industry's dramatic export growth rate "virtually ceased" in 1971, when exports were only two tenths of 1% higher than in 1970, he advised the council at its recent annual meeting.

Geick, executive vice-president of Univac, presented a summary report of the committee's findings and recommendations on industry exports.

The committee, composed of representatives from mainframe and peripheral manufacturers, advocated less domestic restrictions on East-West trade, lessening of foreign tariff and non-tariff barriers and other measures to stimulate expansion of exports.

On East-West trade, one of eight areas outlined in the report, Geick said "the nations of Eastern Europe, the Soviet Union and the People's Republic of China pose vast potential markets for our industry's products."

Commerce Policies

The policies of the Commerce Department's Office of Export Control and the Interagency Advisory Committee are "the most significant cause of our computer industry's inability to fully exploit the Eastern markets," he charged.

"We are concerned with the export restrictions," he added, "because we foresee losing these markets by default to competition from the European Economic Community and the increasingly aggressive Japanese.

"We in the industry see little danger of computers adding any further to the already awesome destructive capabilities of these nations. The social and economic benefits of trade now appear paramount," Geick observed.

"If the Soviet Union really needed a particular sophisticated military computer system, you can be certain they would build it themselves," he added.

Geick emphasized that passage of the Burke-Hartke Bill or similar protectionist legislation would "significantly decrease employment in our domestic office machine and computer industry" because of the retaliatory measures which other countries would be certain to invoke.

He called for a "viable alternative" to the bill and said the committee recommended that another recent bill be given serious consideration.

Other committee recommendations include:

- Longer payment terms for large-dollar-value computer system exports instead of the usual five-year term.
- Removing domestic impediments to foreign investment, including the phasing out of the Office of Foreign Direct Investment.
- Efforts to convince other nations that tariff and non-tariff barriers are detrimental to world trade.
- Better guidelines from federal antitrust agencies on antitrust policy to encourage expansion of exports including the granting of sabbaticals with various businesses to lawyers and economists employed in the antitrust agencies.

8,000 Line/Min Printer Needs An OEM for U.S. Distribution

By Michael Merritt
Special to Computerworld

CUPERTINO, Calif. – An 8,000 line/min electrostatic printer needs an OEM. The developer of the printer, Electroprint, Inc., has found support for the project from Oki Electronics in Japan, but is still considering independent peripherals manufacturers to market the devices in the U.S.

Electroprint plans, though, to have the almost silent EPI-100 in the hands of users for evaluation by May 1973.

The EPI-100's speed isn't affected by width of line or length of character set. Special fonts can be developed by programming the ROM which controls printing, and the flexibility of the printing technique, which uses a dot matrix, lets the printer display raster-scan type graphics.

The machine can give a hefty saving to large-volume users, according to James Sutherland, Electroprint general manager. Basing his calculations on printing about 36 million forms a year, Sutherland claimed the Electroprint unit would cost from $40,000 to $100,000 a year less than an IBM 1403 N1, depending on whether production runs call for single or multiple copies.

Since the EPI-100 is a non-impact printer, it cannot print carbon paper forms. Electroprint's solution to the problem is to equip the printer with a disk memory, and print first copies repeatedly.

The print quality of the EPI-100 is mixed. Registration is superior to standard line printers, but character density and definition don't show much improvement over current standards. Frank LaHaye, president of Electroprint, said print quality will be improved on production models.

Electroprint estimates printer and controller will rent for $2,000/mo, and disk capacity will cost $700/mo more. Purchase prices would range from $80,000 to $100,000. The EPI-100 will have standard plug-compatible interfaces, but will not operate directly from IBM's Integrated Printer Adapter on the 370s.

The printing head of the EPI-100 is actually a perforated bar. Each of the holes in the bar can be individually charged and the pattern of charged holes thus determines the pattern of the ink sprayed on the paper.

Electroprint is at 10061 Bubb Road, 95014.

Hitachi Refines Laser Memory

By Dempa Publications, Inc.

TOKYO – A new high-density image storing system using a laser holography memory was displayed at the recent Japan-U.S. Computer Show here.

The method, developed by Hitachi, Ltd., provides direct, high-density memory storage of both digital and analog information including graphic representation, the firm said.

The holographic memory consists of laser beam memory elements used to record information in a storage medium as interference fringe patterns.

The new technique can store all information, including photographs, diagrams and letters, contained in 500 pages in a space equivalent to one postage stamp, or about 10,000 letters in a space 1 mm in diameter.

The defect of past image memory technology, in which an improvement of the image resulted in a lessening of the storage density, has been overcome, Hitachi said. In the new memory, analog information is divided into parts smaller than the human eye can detect and subjected to laser beams, which then pass through random-phase shifters and are concentrated by lens.

The random-phase shifter, also developed by Hitachi, is a special optical plate that allows image information storage by evenly distributing the information-bearing laser beams in the storage medium.

The plate is made of multilayered thin films of cerium oxide evaporated through several kinds of random-pattern screens onto a glass substratum.

Reading is done by throwing a laser beam on the holograph memory. The image is reproduced automatically and there is no need for optical elements such as lenses, the firm said. Reading speed is 1 μsec.

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User Migration—Part IV

Used Computer Market Could Collapse if Lessors Sell

By E. Drake Lundell Jr.
Of the CW Staff

NEWTON, Mass. – The used computer market could "completely collapse" if large 360 leasing organizations decide to dump their inventory of equipment and get out of the leasing business in the face of user migration to 370 equipment, according to International Data Corp., a market research firm here.

On the whole, the firm said, the market today is in balance, even though price fluctuations can still occur with small changes in the supply and demand.

"But just as the market for leased 360s faces price decline as demand slackens and supply increases, so too does the market for used 360s.

"Furthermore, when one considers that each of the large leasing companies has a portfolio almost equal in size to the value of used equipment traded in all of 1972 by all brokers, it is not hard to speculate on what will happen if any leasing companies begin to dump 360s in an effort to get out of the business.

"Whatever structure this market has could completely collapse," IDC said.

But for the present, IDC said, its recent survey of 360 and 370 users "uncovered significant interest in the purchase of used 360 mainframes."

'Firm With 360s'

"A number of IBM's potential 370 converts indicated they will stand firm with 360s, enhancing the processors through independent peripherals and add-on replacement main memory to a price/performance level comparable to 370 models," the firm said.

In addition, several installations surveyed plan to add purchased 360s to back up present 360s and make them price/performance competitive with the 370 line, the firm added.

Because of these trends the firm estimated at least 300 used 360/30s, 40s, 50s and 65s will be placed in the hands of brokers during 1972 and another 200 during 1973 – but the figure could well be higher.

The brokers, IDC forecast, will be able to trade over 85% of these used machines this year, making the equipment traded worth some $282 million calculated at original IBM purchase price.

The major reason for the slowdown in the used computer market in 1973 will be that many users will decide to hang on to purchased 360s while they wait out the new IBM delivery schedules.

Because of this, IDC predicted the used equipment brokers would be able to place just over $160 million in used 360 systems during 1973, valued at original IBM purchase price.

"Market indications point to a degree of stabilization in pricing used 360s at least through the first half of 1973, with rates hovering around 44% to 45% of the original IBM purchase price," the firm added.

Downward Trend

IDC noted the trend in used 360 pricing has been "noticeably downward in the last two years with the heaviest price erosions occurring as the first 370s were delivered."

But at the same time, IDC predicted the recent announcement of the 158 and 168 "may tend to aid used equipment brokers by extending the viable 360 life span at many installations which were planning 155 and 165 installations – many of these users will now wait for 158 and 168 deliveries in the second half of 1973."

Beyond 1973, however, the future of the used computer market becomes problematical, IDC said, with questions such as 'will 360s reach a final point of obsolescence thus signaling a demand halt' and 'will there be a used equipment business for brokers in 370s facing vendors in this market."

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Overseas Orders & Installations

The Tokyo Electric Power Co. has ordered a Univac 1110 multiprocessor system valued at about 58.3 million. The system will be used for customer billing, personnel management, power distribution schedule, engineering and accounting as well as fuel and equipment control.

The Revenue Commissioners of the Republic of Ireland have ordered a dual-processor Honeywell Model 6060 which will be used to develop a nationwide communications net linking local tax offices to the Dublin center. A model 58 will be used for program development work.

Entreprise de Recherches et d'Activites Petroliers, France's state-owned company active in research and refining and distribution of petroleum products, has ordered a Control Data Corp. Cyber 70 Model 72. The system will provide time-sharing capabilities to engineers.

Computel Systems Ltd. has ordered an IBM 370/168 from IBM, Canada.

An Italian insurance firm, Assicurazioni Ausonia of Milan, has ordered a Univac 1106. In addition to accounting, payroll and payment request applications, the system will process contracts in real-time.

The Faculty of Mathematical and Physical Sciences of Nijmegen University, Nijmegen, The Netherlands, has installed a Digital Equipment Corp. PDP-11/45. The system will be used in a project studying the feasibility of making computer graphics less expensive.

Ramkhamhaeng University, Bangkok, Thailand, has ordered a Control Data 3100 system for research, administration and student training.

The Ministry of Transportation & Communications for the Province of Ontario in Canada has leased two Model ECM-65 extended-core memories from Ampex Corp. for its IBM 360/65, which processes engineering and scientific applications.

The University of Zagreb, Yugoslavia, has installed a Univac 1106 at its computer center, which is designed to serve as the heart of a nationwide network. The system will be used for projects to advance the economic, social and cultural life of Yugoslavia.

The government of Poland has ordered three 6135 systems from EMR Computer. The systems will be used for seismic data processing by the Geophysical Division of the Ministry of Geology, and the Ministry of Mining and Energy.

Document Reader Suited for OCR

SILVER SPRING, Md. – Computer Entry Systems Corp. has unveiled the CES 7100 document reader, designed for low-volume OCR applications. The system accepts documents from 2 in. by 3 in. to 6 in. by 9 in., with line length and position variable.

Data may be OCR-A numeric or alphanumeric or mark sense. The 7100 functions as a stand-alone or terminal and can be linked to a keypunch, tape, minicomputer, modem or CES Series 8000. Options include auto feed, mark sense and check digit features. The basic system costs $4,450 in quantities of 100 from 2141 Industrial Parkway, 20904.

Transport Handles 75 in./sec

MELVILLE, N.Y. – The AT 1052 automatic threading magnetic tape transport from Potter Instrument Co., Inc. has bidirectional speeds up to 75 in./sec.

The transport is designed to handle read/write operation up to 800 bit/in. NRZI and 1,600 bit/in. PE, and is compatible with IBM 729, 2401, 2420 and 3420 series transports. The unit is priced at about $5,000 from 532 Broad Hollow Road, 11746.

Other OEM Products

The PI-72 incremental cassette recorder from International Computer Products, Inc., Dallas, operates at speeds up to 300 char./sec and provides a ninth bit for control or use with extended code sets. The PI-72 costs $600 in quantity, $1,015 in single units.

– – –

The Controlpac 600 programmable logic controller from Eagle Signal, Davenport, Iowa, includes 16 outputs, 16 inputs, a 256-word programmable read-only memory and a 256-bit random-access memory for a $2,070 price.

– – –

Two new Q core read-only memory systems from Quadri Corp. are designed for use with Microdata and Interdata mini systems. Priced at 2.5 cent/bit down to 2 cent/bit, the unit for the Microdata 800 features a 95-nsec access time and a 220-nsec cycle time and is available as 512 by 16 bits, 1024 by 16 bits and 2048 by 16 bits.

New OEM Products

The unit for the Interdata 70 is priced at 2.2 cent/bit to .8 cent/bit and features a storage capacity up to 8K and an access time of 200 nsec and a cycle time of 600 nsec. The firm is at 2950 W. Fairmont, Phoenix, Ariz. 85017.

Telex Communications Division has introduced the Termi-138 series of cassette tape drives which features bi-directional operating speeds of 2 to 15 in./sec, fast forward/reverse of 60 in./sec; standard hysteresis synchronous capstan motor and a 2-track magnetic head.

– – –

Powertec, Inc., Chatsworth, Calif., has designed a line of multiple output DC power supplies in dual- or triple-output configurations. Prices for 100-lot orders start at $37 for dual-output units with currents of 2.5A.

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Overseas Tape, Disk Market Growing, Special Items Seen as Hot Sellers

LONDON – The market for tapes and disks in Europe is large and growing, and it is also a market where most suppliers can compete on relatively equal footing, according to IDC Europa, a market research firm here.

But while there is a large market, the most exciting markets for the next few years will be in "special" disk packs like the ones used by the IBM System/3, the firm said.

At the end of 1971, there were over 325,000 disk packs in use in Europe at more than 11,000 sites, the report stated, adding there were almost 6.3 million tapes in use at 11,500 user locations.

During 1971 users spent $90.7 million on magnetic media, with around $58 million being spent on disk packs and the rest on tapes, IDC Europa reported.

In the disk area, the expenditures represented a drop of around 10% from the year before, but IDC Europa reported current users expected to rebound with an increase of around 14% during 1972.

Spend Less

The expenditures for tapes in 1971, however, showed an increase of around 3.5% over the amount spent in 1970, the firm said, but it noted users expected to spend about 8% less in 1972 than they did in 1971 for magnetic tapes.

Breaking the market down by regions, the firm reported that the UK represents between 18% and 25% of the total European market for magnetic media.

There are presently 74,500 disks in use at 2,900 sites, the firm said, and 1.5 million tapes being used at just over 3,000 installations.

The total UK expenditure on such products in 1971 was pegged at $17.4 million by the research firm.

"In general," the firm said, "sites in the UK made use of less tapes and disks than sites elsewhere in Europe and have correspondingly less expenditure. The average disk-using site in the U.S. has 25.8 disk packs and the average tape user has 492 tapes."

The UK is also somewhat behind the rest of Europe in the number of 11-high disk packs in use, the firm said.

In the European Economic Community, the firm said there were 200,000 disk packs in use at 6,800 sites at the end of 1971 and around 3.5 million tapes used by 6,650 tape users.

During 1971, these users spent a total of $60.3 million, the firm estimated, with around $38 million on disks.

"A high proportion of disk packs in the EEC is rented (46.3%) and there are measurably more 11-high packs (48.5%) than 6-high packs. In general, expenditure and usage levels tend to be somewhat higher than in the UK, with an average of 28.3 packs at disk-using sites and 534 tapes at tape-using sites," the firm said.

In other areas – the European Free Trade Association, Spain and Greece, – there are 1,600 disk sites and 1,760 tape sites, which accounted for 53,500 disk and 1.2 million tapes in 1971, the firm added.

While they are the smallest of the three areas covered by the report, these users have a higher average use per site than either of the other two, the firm stated, with the average disk user having 33.6 disks and the average tape user having 683 tapes.

During 1971 these users spent $13.2 million for magnetic media, with around $8.5 million going for disks.

In addition, the firm said these sites were more sophisticated than the others in Europe, "since 53% of all packs are 11-high, compared to only 38% 6-high. With tapes there is a much greater tendency in this area to shop around for suppliers."

Executive Corner

■ Richard H. Burt has joined Ampex Corp.'s Computer Products Division as national sales manager, end user products.

■ Charles L. Toot has been named director of measurement systems at Teradata Systems Corp.

■ E. Neal Frandsen has been appointed western regional manager, Field Engineering Division for Itel Corp.

■ Gordon Whatman is responsible for Canadian marketing activities of Itel Corp.'s Computer Leasing Division.

■ Henry R. Albiez has been appointed technical sales manager, Europe, for Decision Data Computer Corp.

■ James M. Arnold has joined Atlantic Technology Corp. as president and chief executive officer.

■ D. Ray Whitson was named president and chief executive officer of Datotek, Inc., and George E. Goode chairman of the board and director of research.

■ Robert J. Moore has been named general manager of Bunker Ramo Corp.'s Information Products Division.

■ Frank D. Sweeten has been named a staff vice-president of the Sperry Rand Corp.

■ Edward E. Ahnell has been named vice-president and Eastern regional manager of Boothe Computer Corp.

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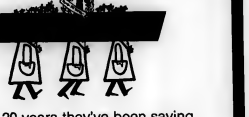

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Genesis Gets Exclusive Rights

Boothe Assigns Remarketing Activities

SAN FRANCISCO – Boothe Computer Corp. has turned to outside help for aid in remarketing its inventory of IBM 360 equipment.

The firm, with over 400 360s on lease, has signed an agreement giving Genesis One Computer Corp. exclusive national marketing rights to all Boothe-owned IBM 360 equipment.

Many leasing firms are now into the re-leasing cycle for their equipment and their future success depends largely on how well they can remarket the equipment, several industry sources noted.

As the first leases run out on the equipment, the lessor must find a new customer, especially for equipment that has not been fully paid for by the initial leases.

Some of the leasing firms reportedly have had a difficult time re-leasing equipment, sources noted. While some firms have had no problem, it has been estimated that the total value of off-lease equipment owned by the leasing firms could amount to 3% of the total inventory.

For individual firms, some have estimated that off-lease inventory could run as high as 5% to 7%. This is a dangerous level for a leasing company, they said, because not only is it not producing new revenues, but the off-lease inventory is expensive in terms of storage space, etc.

In addition, several sources said it is beginning to cost some of the leasing companies an unacceptable amount in remarketing expenses in order to get the equipment back on new leases.

The Boothe/Genesis agreement may be a way of keeping down these remarketing costs, sources suggested. Genesis One already has a large sales organization devoted to re-leasing equipment owned by Management Assistance Inc., its parent company, and the firm's newer end-user product lines.

The agreement frees Boothe from the necessity of enlarging its own marketing srm to penetrate the market for leased equipment.

Natural Fit?

Other sources noted there seems to be a naturel fit between the products of the two firms. Genesis and MAI are heavily into the leasing of unit record equipment, while the Boothe line is principally in 360 equipment.

Therefore, the sources said, MAI might already have an "in" with several customers who have found renting unit record equipment satisfactory and now want also to rent their CPUs.

"We've already booked some $2 million in rentals of Boothe 360s," Myron Angier, Genesis One president, said, promising, "we're aggressively going after a major share of the $5 billion 360 market."

Raytheon, National Data Settle

LEXINGTON, Mass. – Raytheon Co. has agreed to withdraw from the hospital information systems market as part of the litigation settlement with National Data Communications Inc. (CW, Aug. 2).

Raytheon will also supply National and its Reach Corp. subsidiary with display terminals and associated equipment for use in a communications information system for hospitals.

Nonrecurring Profit

Raytheon estimated cost of the settlement and market withdrawal at 20 cents a share, or $3.3 million, which will occur as an extraordinary charge in the third quarter. National will show a nonrecurring profit of $2.21 a share, or $3.8 million in its fourth quarter.

Originally, Raytheon sued National for alleged breach of sales contract covering purchase of the terminals by National. National countersued, charging that Raytheon had used National's list of prospective customers in selling its proprietary system.

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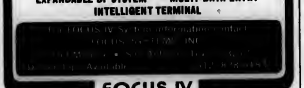

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3 Communications Firms Post Rise In Nine-Month Earnings, Revenues

Three communications-oriented firms have reported improved earnings and revenues for their nine-month periods. Wiltek, Inc.'s revenues were more than double those in the same period last year; and Milgo Electronic Corp. and Codex Inc. showed sharp turnarounds.

Wiltek earnings rose to $280,000 or 19 cents a share in the nine months ended July 31 from $259,000, or 11 cents a share in the comparable 1971 period.

The 1972 figure includes a special credit of $20,000 or 1 cent a share, while the 1971 figure reflects a $104,000 or 8 cents a share credit.

Revenues for the period more than doubled, reaching $4.2 million from almost $2 million in the same period last year.

Orders totaling almost $6 million were received in the nine months, bringing the backlog to a record high of about $4 million, Wiltek said.

Buoyed by record earnings and sales in the three months ended June 30, the Codex nine-month report also showed a turnaround.

For the third quarter, earnings totaled $277,000 or 21 cents a share, compared with a loss of $273,000 or 26 cents a share in the year-ago period. The 1972 earnings included a $124,000 or 9 cents a share special credit from tax loss carryforward.

Nine-month earnings, including a $90,000 or 7 cents a share special credit, rose to $194,000 or 15 cents a share from last year's loss of $572,000. As of the six-month report, Codex had a loss of $82,294 or 6 cents a share.

Revenues for the period climbed to $2.7 million from $2.2 million.

Milgo also showed a strong third quarter, with earnings climbing to $571,000 or 36 cents a share from $140,000 or 9 cents a share on a revenue jump to $3.5 million from $2.3 million.

In the nine months, earnings totaled $1.4 million or 89 cents a share compared with a loss of $93,000 or 6 cents a share in the comparable 1971 period.

Revenues for the nine months climbed to $8.9 million from $6.2 million.

Systems Engineering Has Sharp Turnaround

FORT LAUDERDALE, Fla. – Systems Engineering Laboratories, Inc. showed a sharp turnaround for the year ended June 30, with earnings of $1.1 million or 43 cents a share compared with last year's loss of $12.4 million or $5.05 a share.

The 1972 figures include a $308,000 extraordinary credit, while in 1971 there was an extraordinary loss of $3.5 million.

Revenues climbed to $15.7 million from $12.8 million in 1971.

Backlog at June 30 was $6.2 million, up from $5.2 million at the beginning of the fiscal year.

Nickels & Dimes

Ampex' first-quarter loss of $3.2 million or 29 cents a share was less than originally expected, the company revealed.

Under an agreement with North American Corp. providing for sale of Ampex DP equipment on lease through 1975, Ampex sold about $5 million worth of equipment in the first quarter.

$$$

A record second quarter at National CSS boosted earnings to $349,857 or 32 cents compared with $124,396 or 11 cents a share last year. Revenues rose 55% to $4 million from $2.6 million in the 1971 period.

$$$

Terminal Equipment posted its first profitable quarter in the three months ended June 30, with earnings of $19,253 or 4 cents a share. Revenues of $217,030 were almost nine times larger than those of the 1971 period.

$$$

Interdyne's third-quarter loss of $18,000 on a 42% rise in sales was "a direct result of costs associated with the introduction of new products, primarily the IC 2500 Digital Cassette Tape Drive," according to President T.D. Caswell, who noted the firm has a backlog of about $400,000 for that product.

New Registrations

INTERACTIVE DATA CORP., 486 Totten Pond Road, Waltham, Mass., a time-sharing firm, filed to register 300,000 shares of common at $25 per share. The underwriter is C.E. Unterberg, Towbin Co., 61 Broadway, New York, N.Y. 10006.

DIGITAL EQUIPMENT CORP., 146 Main St., Maynard, Mass., computer manufacturer, filed to register 600,000 shares of common. Proceeds, at $90.25 per share, to be used to repay short-term indebtedness and for working capital. The underwriter is Lehman Brothers Inc., One William St., New York, N.Y. 10004.

APPLIED DIGITAL DATA SYSTEMS INC., 100 Marcus Blvd., Hauppauge, N.Y., a peripheral equipment firm, filed to register $1.2 million of convertible subordinated debentures, due 1981. Proceeds to be used to expand leasing operations and for working capital. The underwriter is Mandelbaum Securities Corp., 50 Broadway, New York, N.Y.

COMPUTER AUTOMATION INC., 1651 Von Karman Ave., Irvine, Calif., minicomputer manufacturer, filed to register 310,000 shares of common. Proceeds, at $22 per share, to be used to repay bank borrowings and for working capital. The underwriter is New York Securities Co. Inc., One New York Plaza, New York, N.Y. 10004.

TELEMED CORP., 9950 W. Lawrence Ave., Schiller Park, Ill., a firm engaged in computerized evaluation of medical tests, filed to register 100,000 shares of common. Proceeds, at $15 per share, to be used to purchase new equipment and for working capital. The underwriter is S.D. Lunt & Co., 120 Broadway, New York, N.Y. 10005.

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TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC Cambridge, Mass 02139

CLOSING PRICES THURSDAY, OCTOBER 12, 1972

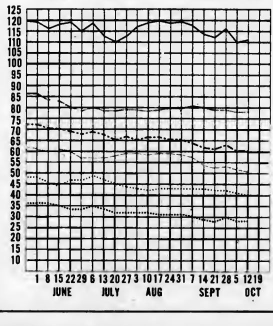
EXCH		PRICE 1972 RANGE (1)	CLOSE OCT 12 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE A EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	2 1/8	- 1/4	-10.5
A	APPLIED DATA RES.	4- 7	4	0	0.0
O	APPLIED LOGIC	1- 4	2 1/2	0	0.0
N	AUTOMATIC DATA PRDC	72- 99	88 5/8	-1 1/8	-1.2
O	BRANDON APPLIED SYST	1- 2	7/8	- 1/4	-22.2
O	COMPUTER DIMENSIONS	6- 14	6 1/2	- 1/4	-3.7
O	COMPUTER DYNAMICS	1- 4	7/8	0	0.0
O	COMPUTER NETWORK	3- 7	3 1/4	-1	-23.5
N	COMPUTER SCIENCES	5- 10	5 1/8	0	0.0
O	COMPUTER TASK GROUP	1- 2	1	0	0.0
O	COMPUTER TECHNOLOGY	4- 8	4	0	0.0
O	COMPUTER USAGE	7- 14	9 3/4	+ 1/2	+5.4
O	COMP AUTOMOT REPORTS	5- 9	6 1/2	+ 3/4	+13.0
N	COMPUTING A SOFTWARE	14- 28	15	0	0.0
O	COMRESS	1- 3	1 1/4	0	0.0
O	COMSHARE	5- 10	6 3/8	0	0.0
O	DATATAB	5- 9	4 5/8	- 1/8	-2.6
O	EDP RESOURCES	3- 8	2 3/4	- 1/6	-4.3
A	ELECT COMP PROG	2- 5	1 1/2	0	0.0
N	ELECTRONIC DATA SYS.	43- 65	54 7/8	-1 1/8	-2.0
O	INFORMATICS	5- 11	5 3/8	0	0.0
O	I.D.A. DATA CORP	1- 3	1 3/8	+ 1/4	+22.2
O	KEANE ASSOCIATES	4- 7	3 3/4	- 1/4	-6.2
O	KEYDATA CORP	7- 13	13 1/4	+ 3/4	+6.0
O	LOGICON	4- 9	6 5/8	+ 3/8	+6.0
A	MANAGEMENT DATA	5- 10	4 1/2	- 1/2	-10.0
O	NATIONAL CSS INC	8- 26	26 5/6	+1	+3.9
O	NATIONAL INFO SRVCS	2- 5	1 5/8	- 1/4	-13.3
P	ON LINE SYSTEMS INC	8- 20	22 1/2	+ 1/2	+2.2
N	PLANNING RESEARCH	7- 17	7	- 1/4	-3.4
O	PROGRAMMING METHODS	20- 24	21 1/2	0	0.0
O	PROGRAMMING A SYS	1- 2	1 1/8	0	0.0
O	RAPIDATA INC	5- 25	20 1/4	-3 1/4	-13.8
O	SCIENTIFIC COMPUTERS	2- 4	1 3/4	- 1/4	-12.5
O	SIMPLICITY COMPUTER	1- 5	4 1/8	0	0.0
O	TBS COMPUTER CENTERS	3- 6	3 1/4	- 1/4	-7.1
O	TCC INC	1- 3	1 1/8	0	0.0
O	TYMSHARE INC	7- 11	7 5/8	- 3/8	-4.6
O	UNITED DATA CENTER	5- 6	6	0	0.0
N	UNIVERSITY COMPUTING	13- 26	13	- 1/8	-0.9
A	URS SYSTEMS	6- 10	7 7/8	0	0.0
	PERIPHERALS A SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	34- 49	38	-1 5/8	-4.1
O	ADVANCED MEMORY SYS	12- 23	14	+ 3/8	+2.7
N	AMPEX CORP	5- 15	5 1/8	+ 1/8	+2.5
O	ANDERSON JACOBSON	5- 8	3 3/4	- 1/6	-3.2
O	ATLANTIC TECHNOLOGY	1- 11	3/8	- 3/8	-50.0
O	BEEHIVE MEDICAL ELEC	1- 5	4 3/4	+1	+26.6
A	BOLT,BERANEK A NEW	5- 21	14 7/8	-2 1/6	-12.5
N	BUNKER-RAMO	9- 14	10	+ 1/8	+1.2
A	CALCOMP	10- 25	10 1/4	- 1/4	-2.3
O	CAMBRIDGE MEMORIES	9- 15	9 3/4	- 3/4	-7.1
O	CENTRONICS DATA COMP	11- 53	34 1/2	-3 1/2	-9.2
O	COGNITRONICS	2- 5	3	- 1/4	-7.6
O	COMPUTER COMMUN.	1- 7	2 1/2	+ 5/8	+33.3
A	COMPUTER EQUIPMENT	3- 4	2 3/4	0	0.0
O	COMPUTER MACHINERY	7- 13	8 1/2	- 1/8	-1.4
A	COMPUTEST	3- 9	3 3/4	+ 1/4	+7.1
A	DATA PRODUCTS CORP	3- 7	3 1/2	0	0.0
O	DATA RECOGNITION	1- 5	1 1/4	0	0.0
O	DATA TECHNOLOGY	2- 5	2 3/4	0	0.0
O	DI/AN CONTROLS	0- 8	4 3/8	0	0.0
N	ELECTRONIC M A M	4- 8	3 1/2	0	0.0
O	FABRI-TEK	2- 5	3 3/4	+ 7/6	+30.4
O	GENERAL COMPUTER SYS	7- 16	9 1/4	- 1/4	-2.6
N	GENERAL ELECTRIC	59- 70	63 1/4	-1 5/6	-2.5
N	HAZELTINE CORP	7- 13	7 3/6	- 3/8	-4.8
O	INFOREX INC	20- 36	21	- 1/2	-2.3
O	INFORMATION DISPLAYS	1- 5	1 1/2	- 3/8	-20.0
A	LUNDY ELECTRONICS	9- 14	9 1/8	+ 1/8	+1.3
O	MANAGEMENT ASSIST	1- 2	3/8	0	0.0
N	MEMOREX	16- 36	20 7/8	+1 3/4	+9.1
A	MILGO ELECTRONICS	17- 44	22	- 1/4	-1.1
N	MOHAWK DATA SCI	14- 27	14 1/2	+ 1/8	+0.8
O	OPTICAL SCANNING	7- 16	7 1/4	0	0.0
O	PERTEC CORP	8- 17	11 1/2	+2 3/8	+26.0
O	PHOTON	6- 15	7 1/4	+ 1/2	+7.4
A	POTTER INSTRUMENT	7- 21	7 1/6	+ 1/6	+1.7
O	PRECISION INST.	4- 13	4 1/2	0	0.0
O	RECOGNITION EQUIP	5- 15	6 1/8	+ 1/2	+8.8
N	SANDERS ASSOCIATES	13- 21	14 1/2	0	0.0
O	SCAN DATA	6- 13	6 3/8	- 1/4	-3.7
O	STORAGE TECHNOLOGY	17- 39	29 1/2	+2 1/8	+7.7
O	SYCOR INC	7- 11	9	-1 3/4	-16.2
O	TALLY CORP.	8- 15	10 1/8	-1 7/8	-15.6
N	TEKTRONIX INC	34- 64	51	-1	-1.9
N	TELEX	6- 15	6 7/6	+ 3/8	+5.7
O	WILTEK INC	10- 26	16 3/4	- 1/4	-1.4
	SUPPLIES A ACCESSORIES				
O	BALTIMORE BUS FORMS	6- 9	7	0	0.0
A	BARRY WRIGHT	9- 14	11 1/2	0	0.0
A	DATA DOCUMENTS	17- 26	19 3/4	- 1/4	-1.2
O	DUPLEX PRODUCTS INC	6- 16	8	0	0.0
N	ENNIS BUS. FORMS	6- 10	6 3/8	- 1/8	-1.9
O	GRAHAM MAGNETICS	15- 27	17 1/8	+ 1/2	+3.0
O	GRAPHIC CONTROLS	12- 15	12 3/4	+ 1/2	+4.0
N	3M COMPANY	76- 85	77 3/4	-1 1/2	-1.8
O	MOORE CORP LTD	42- 56	54 1/2	+ 1/4	+0.4
N	NASHUA CORP	46- 62	57	- 1/4	-0.4
O	REYNOLDS A REYNOLD	37- 77	45 1/4	+ 3/4	+1.6

EXCH		PRICE 1972 RANGE (1)	CLOSE OCT 12 1972	WEEK NET CHNGE	WEEK PCT CHNGE
O	STANDARD REGISTER	14- 20	16	- 1/8	-0.7
O	TAB PRODUCTS CO	14- 23	20 1/2	-1	-4.6
N	UARCO	22- 28	21 7/8	+ 1/6	+0.5
A	WABASH MAGNETICS	7- 11	6 3/4	- 1/8	-1.8
N	WALLACE BUS FORMS	21- 26	21 3/4	0	0.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	147-226	211	-2 3/8	-1.1
N	COLLINS RADIO	14- 20	14 3/4	0	0.0
N	CONTROL DATA CORP	43- 78	65 1/2	-3 1/2	-5.0
O	DATA GENERAL CORP	56-115	109 1/2	+4 1/2	+4.2
O	DIGITAL COMP CONTROL	9- 25	6 3/4	- 1/2	-5.4
N	DIGITAL EQUIPMENT	72-101	97 1/4	+5 3/4	+6.2
N	ELECTRONIC ASSOC.	6- 13	8 5/6	+ 3/6	+4.5
A	ELECTRONIC ENGINEER.	6- 14	7 3/4	+ 5/8	+6.7
N	FOXBORO	26- 41	26 1/8	-1 1/2	-5.4
O	GENERAL AUTOMATION	13- 38	31 1/4	-1 1/4	-3.8
O	GRI COMPUTER CORP	3- 5	3 1/4	0	0.0
N	HEWLETT-PACKARD CO	46- 77	71 1/2	+2 1/6	+3.0
N	HONEYWELL INC	122-170	130 1/2	+6 1/2	+6.9
N	IBM	333-426	364 1/2	-10 1/2	-2.6
O	INTERDATA INC	8- 16	12 3/8	- 3/8	-2.9
O	MICRODATA CORP	5- 10	8 1/2	+ 1/4	+3.0
N	NCR	29- 38	36	+1 5/6	+4.7
N	RAYTHEON CO	27- 47	28	+ 5/8	+2.2
N	SPERRY RAND	30- 48	45 3/6	+1 5/8	+3.7
A	SYSTEMS ENG. LABS	9- 16	9 1/6	+ 1/4	+2.8
N	VARIAN ASSOCIATES	14- 22	20 1/4	+ 3/8	+1.8
N	VICTOR COMPTOMETER	15- 24	17	+ 3/6	+2.2
N	WANG LABS.	23- 61	26	+1 5/8	+6.6
N	XEROX CORP	121-172	152 5/8	-2	-1.2
	LEASING COMPANIES				
A	BOOTHE COMPUTER	4- 18	3 7/6	- 1/8	-3.1
O	BRESNAHAN COMP.	2- 3	1 3/4	0	0.0
O	COMDISCO INC	3- 18	16 1/6	+1 1/8	+7.5
O	COMMERCE GROUP CORP	5- 11	6 3/6	0	0.0
O	COMPUTER EXCHANGE	1- 3	1	0	0.0
A	COMPUTER INVSTRS GRP	8- 14	8	+ 1/6	+1.5
N	DPF INC	5- 13	5	- 1/4	-4.7
M	DATRONIC RENTAL	2- 4	1 7/8	- 1/6	-6.2
A	DCI INC	4- 10	3 3/4	-1	-21.0
A	DEARBORN-STORM	16- 26	19 5/8	+ 1/6	+0.6
A	DPA, INC.	5- 8	6 3/8	+ 1/8	+2.0
A	GRANITE MGT	5- 11	6 1/6	+ 1/6	+2.0
A	GREYHOUND COMPUTER	6- 11	6 1/4	0	0.0
A	ITEL	7- 12	9 7/8	+1 7/8	+23.4
N	LEASCO CORP	17- 24	17 3/4	- 3/8	-2.0
O	LEASPAC CORP	6- 15	6	- 1/4	-4.0
O	LECTRO MGT INC	1- 4	2	- 1/4	-11.1
A	ROCKWOOD COMPUTER	2- 7	2 1/4	- 1/6	-5.2
O	SYSTEMS CAPITAL	3- 20	13	-1 3/4	-11.8
N	U.S. LEASING	19- 33	27 1/4	-1 1/2	-5.2

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index

—— Computer Systems ----- Software & EDP Services
.... Peripherals & Subsytems .... Leasing Companies
—— Supplies & Accessories -·-·- CW Composite Index



Earnings Reports

BRADFORD COMPUTER & SYSTEMS
Three Months Ended June 30

	a1972	b1971
Shr Ernd	$.13	$.07
Revenue	9,487,675	3,244,240
dSpec Chg	129,157	255,449
cTax Cred	74,480	34,800
Earnings	423,607	235,258
6 Mo Shr	.28	.14
Revenue	14,375,297	6,361,588
dSpec Chg	129,157	437,521
cTax Cred	191,300	45,400
Earnings	925,123	458,890

a-Includes on a full consolidation basis accounts of Bradford Shareholder Services Inc. (BSS), and BT Bradford Stock Services Inc. (BTB). b-Restated to reflect the combination with Bradford Investor Data Services Inc. on a pooling-of-interests basis, effective Feb. 10, 1972, and the equity method of accounting for the investment in BSS. c-From subsidiaries' tax loss carryforwards. d-In 1972, charges for the company's equity in nonrecurring conversion of BTB and in 1971 conversion costs of BSS.

RECOGNITION EQUIPMENT
Three Months Ended July 31

	1972	1971
Shr Ernd	$.07	$.08
Revenue	10,516,000	9,147,000
Spec Item	a160,000	b347,000
Earnings	358,000	447,000
9 Mo Shr	.20	.28
Revenue	29,128,000	27,780,000
Spec Item	b40,000	c637,000
Earnings	994,000	1,463,000

a-Debit; tax loss carryforward adjustment. b-Credit; tax loss carryforward. c-Credit; tax loss carryforward less loss on sale of an investment.

DOCUTEL
Three Months Ended June 30

	1972	a1971
Shr Ernd	$.32	.....
Revenue	4,914,000	$1,235,000
Tax Cred	322,000	.....
Earnings	693,000	(1,318,000)
6 Mo Shr	.49	.....
Revenue	9,232,000	1,683,000
Spec Item	b498,000	d3,457,000
Earnings	1,046,000	(5,417,000)

a-Restated to reflect accounting change. b-Tax credit. d-Charge; write-off of deferred research and development costs.

HEWLETT-PACKARD
Three Months Ended July 31

	1972	a1971
Shr Ernd	$.35	$.20
Revenue	124,977,000	94,017,000
Earnings	9,256,000	5,408,000
9 Mo Shr	.93	.60
Revenue	339,513,000	273,473,000
Earnings	24,458,000	15,628,000

a-Restated.

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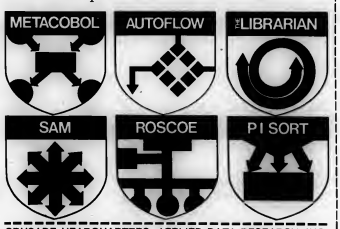

CRUSADE HEADQUARTERS: APPLIED DATA RESEARCH, INC.
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